Railway Age

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EDITORIAL

Railway Age

The Automobile, General Manager and Freight Conductor

The salaries of many railway general officers have been reduced under government operation. The average compensation of those receiving more than $3,000 a year is 20 per cent less than it was when the government took the railways over. On the other hand, the wages of train service employees recently have been advanced again, and now average about 40 per cent more than a year ago. An incident illustrating the effects upon the mode of living of the officers and the employees which the reduced salaries and increased wages are producing has come to our attention. The general manager of a certain railroad who has had his salary reduced advertised a Packard automobile for sale. He received in reply a letter from one of the freight conductors on his railroad seeking to buy the car. The general manager has sent us the original letter for our edification. Now that general managers, in order to reduce their expenses, have to sell their high priced automobiles, and their freight conductors offer to buy them, we think the time has about come for railway officers to organize themselves into a trade union. We note that in Europe the bourgeoisie have begun to organize to protect themselves from exploitation by the proletariat. If government operation were continued, and railway officers did not form themselves into a union, it would apparently be but a matter of time until all the officers would be looking with envy upon the automobiles owned by the employees.

Railroad Y. M. C. A. Extension Program

The Railroad Y. M. C. A., after a long period of careful preparation, is about to inaugurate a continental extension program that has a number of unique features and promises to very greatly enlarge and extend the efforts of that organization. The 300 Associations in this country and Canada are carrying forward this movement as a unit; the railroad men, themselves, have done a large part of the planning and will do the greater part of the work, the secretaries or employed officers being utilized largely in an advisory capacity. During the coming week, May 18-24, efforts will be concentrated on increasing the membership. Every Association will be divided into two parts, each of which will strive to make a better record than its opponent in renewing memberships and securing new members. In the same way, different parts of a railroad system will be pitted against each other. Different railway systems will also engage in friendly rivalry. This idea has been extended even to having different regions of the Railroad Administration challenge each other. During the next few months, the new members will be assimilated, and in the fall there will be a series of programs of service which will be participated in simultaneously by all of the associations. For instance, one week will be devoted to making plans and putting into effect educational programs for the year. In a similar way, a week will be devoted to religious work, another to thrift, and others to patriotism and sociability, and health and happiness. The Railroad Y. M. C. A. has been a most important factor in improving the conditions under which the enginemen and trainmen and others have had to work, thus adding to the safety and efficiency of operation. It has, however, largely limited its efforts to serving the road men and has not been as active as it might be in trying to reach all of the railroad men with a service program. The movement which it is entering would seem to be a long step in that direction, and it is to be hoped that it will receive the most cordial cooperation from all railroad men who are interested in the welfare of their fellows.

Making the Railroads Pay for the Waterways

ONE INFLUENCE that has served to make railroad transportation, or at least the privilege of owning railway securities, more expensive than it should be is the zeal with which the United States War Department has protected the potential waterways of the country for a waterway traffic which may come some time in the distant future. Much of this zealous solicitude has worked a burden on the railroads which have been forced to spend vast sums for drawbridges that have never opened to pass a ton of freight, or in high bridges whose expensive channel spans are rarely smutted by the smoke of a passing steamer. Notwithstanding the decadence of inland waterway traffic the demand for larger and more expensive structures keeps ever apace with the advancement of the art in bridge engineering. Where 400-ft. clear spans were considered adequate 40 years ago, 600-ft. spans are now being demanded.

One especially unreasonable exaction of the government in its solicitude for a waterway traffic that is not, but some time may be, was the order for the raising of the Pennsylvania Lines bridge over the Allegheny river at Pittsburgh. In March, 1917, this four-track (two-level) structure was ordered raised 12.5 ft. and the road was given just one year in which to complete the work. Since the demand for this difficult and expensive project came just at our entrance into the world war it is to be inferred that this was a war measure. However, it is of interest to note that the Pennsylvania Lines bridge is the fifth bridge over the Allegheny river above its confluence with the Monongahela, there being four city bridges connecting the Pittsburgh side of the river with the Allegheny side within this distance under which any river traffic coming up from the Ohio river must pass before encountering the railroad bridge. The city bridges were also ordered raised, but the interesting detail of the whole story is that while the railroad was required to raise its bridge within a year's time, the city was allowed 2½ years in which to complete the work on its structures.

The change in the Pennsylvania Lines bridge cost $800,000, while necessary alterations to approaches made the total expenditure considerably over a million dollars. The work has now been completed for over a year, yet not even a beginning has been made in the raising of the city bridges. So while the river traffic is still subject to the headroom restrictions the Pennsylvania Lines are paying the interest on a million dollars additional investment. Whether measures such as this will ever be effective in developing the inland waterway traffic which will be so potent in solving all of our economic and social ills, we cannot say, but meantime the public will be paying the excess cost of railway transportation due to requirements such as this.

Industrial Board's Exit Does Not Restore Normal Conditions

DIRECTOR GENERAL HINES' refusal to pay the steel prices fixed by the Industrial Board has had one good effect. It has caused the board to go out of existence. The board's chairman, George N. Peek, had demonstrated his unfitness for his position. Throughout the negotiations he assumed an attitude well calculated to destroy the confidence and arouse the ire of officials of the Railroad Administration. Besides, it was very doubtful from the board's inception whether it was desirable for the government to continue to try to fix prices, since the war was ended. If it had performed its functions in an intelligent and reasonable way it might have aided in the transition of prices from a war to a peace basis. But government boards, experience has shown, seldom perform their functions intelligently and reasonably. The passing of the Industrial Board is welcome as the removal of one more governmental obstruction to the return of the country to normal industrial conditions and business methods.

The director general of railroads has recently tried, by direct negotiations with the steel companies, to get better prices than those fixed by the Industrial Board. These negotiations have failed, and it is announced that the Railroad Administration will advertise for competitive bids on 200,000 tons of rails. It does not seem highly probable that substantially better prices will be obtained in this way than already have been offered, although the outcome may be different from what now appears likely. The retirement of the Industrial Board from the scene has not restored normal conditions of doing business, in either the iron and steel field, or any other field, in which the railways are large purchasers. There was mighty little competition in prices among manufacturers of steel rails for years before government operation of railways was adopted; and the very fact that the government is now operating the railways affords those who sell materials and supplies to the railways a strong incentive to refrain from very active competition in prices for their business.

Government control gives the Railroad Administration a virtual monopoly of purchases for the railroads, and the Railroad Administration, when W. G. McAdoo was director general and John Skelton Williams was director of purchases, assumed an attitude and adopted a policy regarding purchases which indicated a purpose to use the monopoly power of the Railroad Administration almost regardless of the consequences to concerns from which they bought goods. It centralized control of purchases in such a way as to make it practically impossible for any concern to make a different price to one railway from what it made to all others. Its spokesmen talked about the pooling of patents and the foregoing of royalties. Mr. Williams' treatment of representatives of the supply concerns was not considerate or sometimes even civil, and in many cases goods were bought mainly on the basis of price and almost regardless of quality. The Railroad Administration did not finally drive as hard bargains as apparently it originally intended to, but the former director of purchases succeeded in making almost every class of concerns from which it made purchases feel that it was an unreasonable and disagreeable customer to deal with. This feeling still prevails, in spite of modifications of policy which have been made since Mr. McAdoo retired as director general and Mr. Williams as director of purchases, and as long as it exists concerns that sell materials and supplies to the Railroad Administration will be on their guard, and will not be disposed to risk engaging in very active competition.

The continued existence of the Industrial Board would have been an obstruction to the return of business to normal conditions and methods. But the same thing may be said of the continued existence of the Railroad Administration, and especially of its highly centralized purchasing organization. A monopoly of railroad purchases is an abnormal thing in itself, and the highly centralized purchasing organization adds to the abnormality of the situation. Before normal conditions of competition in price among the sellers of railroad equipment and supplies can be, or indeed probably ought to be, restored normal conditions of competition among the buyers of railroad equipment and supplies should be restored.

The Railroad Administration has made large purchases since it has been in existence, although not as large as were ordinarily made by the railway companies in equal periods. These, we believe, have not included any purchases of rails. All the rail laid under government operation was ordered by the companies under private operation. In other words, the Railroad Administration has not heretofore had to bargain for rails. There had been almost no bargaining regarding rail prices for some years under private operation, the steel companies having fixed the prices, and, in effect, told the railway companies they must pay these prices, or go to some other country for their rail. It will be highly interesting to see how the Railroad Administration, with its position of a practical monopoly of purchases, finally comes out in dealing with the steel companies. One thing is certain. This is, that the railroads need large quantities of rail, and that the welfare of the country demands that the mills be set to work making it.

There are reasonable men among both those who represent the Railroad Administration and those who represent the steel companies; and it is inconceivable that with reasonable men on both sides, the present deadlock regarding prices, which is doing so much harm to the interests directly affected and to the public, will be allowed to last much longer. But, in view of the policy of the steel companies when the railways were privately operated, and when there was competition among the buyers of rail, it does not seem probable that there will develop very active competition between the steel companies for railroad business while the railways are in the hands of the government, and while in consequence there is no competition among the buyers.

Government Control of Railroad Labor

WILLIAM CHURCH OSBORN in a recent address which we publish elsewhere in this issue, undertook to show that the government has not taken entire control of the railroad industry, but of only one-half of it. Railway labor, he said, gets 50 per cent. of railway earnings, but the government has not taken control of the employees.

The case is at present even worse, in a way, than Mr. Osborn said. In December, 1917, the last month of private operation, the railway employees received as wages 61 cents out of every dollar of operating expenses and 45.4 cents out of every dollar which the railways earned. In January, 1919, under government operation, railway employees received as wages 64 cents out of every dollar of operating expenses and 58 cents out of every dollar which the railways earn. While, however, the total earnings in December, 1917, represented all that the public paid for transportation, the total earnings in January, 1919, failed by about $40,000,000 to represent all that the public must pay, this being approximately the amount of the deficit which was incurred and which must be defrayed by the taxpayers. The railway employees received as wages about 52 cents out of each dollar that was collected by the government for railway purposes in the form of both rates and taxes.

How far the government has fallen short of taking control of railway labor is indicated by certain significant facts. As we recently pointed out, the railway employees last year asked for changes in wages and working conditions which

it was estimated would cost one billion dollars a year, and they have now been given changes in their wages and working conditions which are costing at the rate of about one billion dollars a year. The government has permitted and even encouraged all classes of employees to organize. We do not criticise this, but merely call attention to the fact. When the question of whether piece work in the shops should be abolished came up the government submitted the determination of it to a vote of the employees concerned; and because they voted for its abolition piece work was abolished, regardless of the views of a large majority of the officers of the roads. To say that the government has not taken control of the employees is stating the case very mildly, indeed.

During recent months many persons have been energetically applying themselves to a study of the question of what shall be done with the railroads. Public sentiment favors their return to private operation. Upon the policy adopted by the government regarding the settlement of controversies arising between the railway companies and their employees will very largely depend the success of private operation if it is resumed. Under government operation labor troubles have been prevented mainly by the simple expedient of giving labor practically everything it has asked for, and then passing the burden along to the public in the form of increased rates and taxes. Private companies cannot advance rates easily, nor can they have recourse to the taxpayers. If the government should return the railways to private operation without providing means of settling labor disputes fairly and without resort to strikes and without providing means for enabling the companies promptly to recoup themselves for increases in their payrolls, past and future, the results would be disastrous both to the companies and the public. Nevertheless, there is a marked tendency on the part of commercial bodies and public men that are studying the railroad problems to side-step this vitally important labor question.

The railway labor organizations are not side-stepping it. Under the plan which is being advocated on their behalf by Glenn E. Plumb, the government would buy the railroads with the taxpayers' money, and then turn them over to be operated by a board of directors, three of whose members would be appointed by the President of the United States, three by the railway officials and three by the railway employees. All wages and salaries would be fixed by a board composed equally of officers and employees. Under this plan an "officer" would be merely an employee of high rank. Therefore, the railway employees would solve the railway problem, including the labor part of it, by having the public furnish the money to buy the roads and pay the interest on the purchase price, and then turn them over to be operated by and chiefly for the benefit of the employees. This would solve the labor part of the problem—at least from the employees' standpoint. How could there be any dissatisfaction on the part of labor if labor was allowed to run the roads and fix its own working conditions and pay? The experience of the last year, when labor has demanded and got an increase of one billion dollars a year at the expense of the public may cause the public to suspect that this method of solving the problem might prove rather expensive for it. But Mr. Plumb can prove the contrary. He is the greatest magician in effecting paper railroad economies that has yet appeared—greater than William Randolph Hearst, Clifford Thorne, S. W. Brookhart or William G. McAdoo. None of the miracles these gentlemen have predicted would be worked by government operation has been wrought; but Mr. Plumb is undaunted by their experience and shows with airy facility how under his plan of "operatives' management" there could be effected a saving of a billion dollars a year. The old rule still holds good—the less a man knows about the railroad business the more oriental are his dreams as to what could be done with it.

In view of the fact that labor has been so influential under government operation and has profited so enormously by it, it is not surprising to find labor asking the public to now buy the railroads and turn them over to the complete and avowed management of the employees. Recent experience affords some apparent justification for the belief of many employees that they can get anything they ask for and insist upon having. It is this very attitude on their part which makes it so necessary that the labor problem on the railways shall be squarely faced and fairly but firmly dealt with. The government will never under private operation cease strictly to regulate the conduct of the companies which own the roads and the officers who manage them. Unless it asserts a corresponding authority over the relations between the employees, on the one side, and the companies and the public on the other, no policy of regulation which it may adopt will more than very temporarily serve its purpose.

New Books

Government Ownership of Public Utilities in the United States. By Leon Cammen, M. A. Distributors: McDevitt-Wilson, 30 Church Street, New York, N. Y.; Price $1.50.

By public utilities, Mr. Cammen, apparently, refers to the railroads, telephone and telegraph lines. He confines himself to a study of the effect that government ownership would have on American institutions other than the railroads themselves. This is not primarily a discussion of whether government ownership would lead to more efficient and satisfactory movement of freight and passengers, but rather a discussion of the effect that it would have on the public, the political parties, the control of industries, the legal relations between the federal government and the states, and on labor. An argument that is sometimes used in favor of government ownership of railroads is that they are so powerful to make or break industries and they affect so vitally the interests of all classes of citizens that they cannot safely be entrusted to the management of private individuals. Mr. Cammen undertakes to show that, whereas under public regulation the private citizen, the owner of a small factory, or the aggrieved traveler, can meet the railroad company in the courts on an equal footing—in a loss and damage claim in advantage generally is all with the claimant against the railroad—if the government owned and managed the roads a suit against the government would be almost prohibitively expensive and nearly hopeless. Most people who have disinterestedly watched the experiment in government operation which has been going on in the past year and a half will be inclined to thoroughly agree with Mr. Cammen.

Railroad labor would at the start, at least, Mr. Cammen believes, get higher wages from the government than it could get from private corporations, but, even if railroad labor, itself, benefited to some extent from uneconomically high wages, all other labor in the country would be taxed to pay this uneconomically high wage to the railroad men. Mr. Cammen figures that labor, including agricultural labor, constitutes 80 per cent of the population. If taxes are raised either through increased costs of transportation passed along to the consumer or directly, in order to meet a deficit in the government operation of railroads, the 4 or 5 per cent of the population which is represented by railroad labor and its dependents would profit to some extent but the other 75 per cent, which is labor other than railroad labor, would have to foot the bill. Mr. Cammen's book is logical, well written and his arguments are non-technical and clear. Treating the subject from a purely American point of view as he does and from an angle somewhat different than that from which it is generally discussed, he has made a distinct contribution to the literature on this subject.

Letters to the Editor

Deferred Railroad Maintenance — An Increasing Public Debt

HOUSTON, Texas.

TO THE EDITOR:

Volumes have been written by those associated with the United States Railroad Administration, and lengthy reports have been rendered, to illustrate reductions in expenses and various savings accomplished during the federal management of railroads, resulting from centralizing control, unifying terminal facilities, direct routing of car-load freight and other similar activities.

But of the work left undone, of the non-performance of duties resting upon them—duties to the public and to the owners of the railroads alike, the spokesmen for the Railroad Administration say nothing. Not a word from them, or their assistants, or from the assistants to the assistants. These unaccomplished obligations exist on every railroad, and deferring their performance does not eliminate the government's liability to eventually meet them, either by the physical performance of this deferred work at a later date and increased cost or by the payment of its value to the owners of the railroads.

One of the most important subjects resulting from the control and operation of the railroads of the United States, through the agency of the director general, is that of maintenance, in its practical application, so that the railroads may be returned to their owners unimpaired, and without deterioration, upon the termination of federal control. Under the provisions of Section 5, (Upkeep), of the standard contract covering the operation of the railroads by the director general, certain sums shall be expended for the maintenance, repair, renewal, retirement and depreciation of the properties of the railroads, in order that such properties may be returned to the owners in substantially as good repair and in substantially as complete equipment as it was on January 1, 1918, the date when federal control became operative.

The expenditures to be made during federal control are to be predicated upon the annual average of similar expenditures made by the railroads during the test period—that is, the three years ending June 30, 1917; making due allowances for any differences in the costs of labor and material, which have actually advanced to an abnormal degree. Briefly stated, the duties of maintenance are to expend an equal amount of labor and an equal quantity of material, during any year of federal control, as was expended during the annual average of the test period. A mere comparison of the money expended would lead to the belief that this had been done; the final total of operating expenses chargeable to maintenance of way and structures for the year ending December 31, 1918, will probably be as much as 50 per cent in excess of the average for the test period. But this does not reflect excess maintenance or even equal maintenance during federal control; as a matter of fact, there has been allowed to accumulate an alarming amount of deferred maintenance. This represents work which should have been performed in the interest of public safety and to eliminate deterioration of the most vital factor of the nation's existence—the national arteries of commerce and communication.

Under the stimulus of a desire to gratify the employees, increases in salaries, entirely out of proportion with the increases in living costs, were granted. To have met the increased living expenses, in awarding increased wages, would have been reasonable and expected. But, as an example, the average retail prices of foods increased 43 per cent during 1918 as compared with the test period, while the wages of section men increased 82 per cent, or very nearly twice as much, and while the cost of food in 1919 has not materially changed, the wages of section men are more than double what they were during the test period. Equally exorbitant increases were granted in other departments; and while the nation, as a whole, was denying itself, in a patriotic effort to bear the burdens of the great war, the average railroad employee was enjoying a better existence than he had ever dared to imagine; an enjoyment of life at the public's expense and increasing the public's burden.

While the government's expenditures for labor during 1918 were far in excess of what had been spent during previous years, the results attained were equally far below the normal. A very severe labor shortage existed, and many railroads were maintained with less than 60 per cent of their normal maintenance forces. This shortage became so acute at one time that it developed the necessity, in many instances, of employing women and boys on the track, the result being an inferior amount and quality of service at a greatly increased cost.

Material values also increased, for varying causes, the advance for steel rails approximating 100 per cent, track fastenings 75 per cent, track ties 80 per cent, bridge lumber 45 per cent and building material over 60 per cent. Coupled with these advances in cost, there was a grave shortage in all of the principal classes of materials. A large portion of the steel output was required for war purposes, lumber was needed for shipbuilding, and the railroads were left with but a small portion of their requirements. In the case of track ties, the Railroad Administration could have secured sufficient for their needs, but, while they increased the prices paid for ties, they instituted an entirely new set of specifications which, coupled with slow payments, seriously reduced the tie supply.

The wearing away of the rails in the track continued during 1918 just as it had in previous years—there was no reduction made in this wear. At the same time only a small percentage of their requirements was furnished. In the case of ties, the rotting, breaking and wearing out of track timber was not decreased in the least during 1918, although the roads under federal control were given less than 75 per cent of these requirements during 1918. The condition with respect to other classes of material was the same. And while the Railroad Administration paid more for material during 1918 than had been spent by the railroad companies during any previous year, they have not maintained the property of the railroads; they have not offset the annual wear and tear with its equivalent in new life.

The result of this failure to perform the duty of maintenance—this failure on the part of those charged with the maintenance of the railroads for the government and as agents of the public—is found in the physical condition of these railroads today. It is represented by the deferred maintenance of the property, the value of which, translated into dollars, has not been saved to the public, but must inevitably be faced and overcome by the expenditure of the required amount of labor and material.

And the longer this work is deferred, the more it will cost when finally undertaken. It is estimated that the present cost of doing the maintenance work, deferred during 1918, will vary from $100 to over $300 per mile and will average in excess of $160 per mile, or over $36,720,000. This is but another item on the debit side of Uncle Sam's books, and while not seeming so very large to us who have learned to think of costs in billions of dollars, it is a tidy sum, owed to the railroads by the Railroad Administration, and which the public must liquidate.

F. S. SCHWINN,
Corporate Engineer, International & Great Northern.

Plan of Price Stabilization Abandoned

The Railroad Administration Has Asked for Competitive Bids for Rails and Other Steel Products

WASHINGTON, D. C.

THE GOVERNMENT'S PLAN of "stabilizing" prices through the efforts of the Industrial Board of the Department of Commerce has finally collapsed and the resignations of the members of the board which had been submitted on April 22, were accepted by Secretary Redfield on May 9, thus leaving prices subject to the law of supply and demand.

After having failed to reach any agreement with the steel interests on lower prices than those announced by the board, the Railroad Administration has asked for competitive bids on 200,000 tons of rails and presently a demonstration will be afforded as to whether it can purchase at lower prices than those approved by the board. The requests for bids went out Saturday. They ask prices on both open hearth and Bessemer steel, 80 to 135 lb. sections, f. o. b. cars at mills, to be submitted this week, Saturday, May 17, to the Division of Purchases, delivery to be completed by July 1. The quantity named is a smaller tonnage than would have been asked for if a satisfactory price had been proposed and probably is to be regarded as a test of the market*. Henry B. Spencer, director of the Division of Purchases, and T. C. Powell, director of the Division of Capital Expenditures, represented the Railroad Administration at the conference with the steel people at New York on May 8, and suggested a price of $41.37 for rail, but the steel interests insisted that further reductions cannot be made without decreases in costs of production which would necessitate a lowering of wage rates. After the meeting Director General Hines, who was also in New York, issued a statement explaining his position, in part as follows:

Mr. Hines' Statement

"Messrs. Spencer and Powell offered specific criticisms of the steel prices heretofore proposed and suggested maximum prices which the Railroad Administration would feel justified in paying. It was made clear that the Railroad Administration did not wish to obtain preferential prices as compared with the general public. The conferences on this subject are at an end and the Railroad Administration will, in accordance with its settled purpose, proceed as rapidly as it needs steel materials of any kind to ask for competitive bids and purchase accordingly.

"By way of comment on the prices proposed in March, as well as in support of the prices suggested by the Railroad Administration, the following views were expressed by Messrs. Spencer and Powell.

"The reduction since the war in a single element of cost is so great as to make the prices proposed practically as profitable as were the higher prices that prevailed during the war upon the basis of which the steel interests made enormous profits. This is the price of scrap materials, which is not a controlled commodity, but the price of which fluctuates according to supply and demand, and which, of course, can be and is used very largely in the making of steel products. The fall in the price of scrap material (from $30 per ton to about $15 per ton) has been so great that the resulting decrease in the cost of steel products is practically as great as the total proposed reduction in the prices. Therefore, the prices proposed for steel products represent no concessions whatever from wartime profits.

"That the steel interests have made profits so large as to make substantial concessions practicable under existing conditions without affecting the wages is strikingly illustrated by a consideration of the profits for the calendar year 1918.

"The United States Steel Corporation for the year 1918 reports the net earnings from all rolled tonnage, before deducting income tax, excess profits tax, etc., a profit of about .....$33 per ton

"The Midvale Steel Company for the same period shows a profit of approximately.....$35 per ton

"This statistical information for other steel producing companies is not yet published, but their financial statements indicate results which were correspondingly favorable.

"The arguments which have been presented in the effort to support the prices proposed by the steel interests and the Industrial Board have rested upon costs incurred during the war period. Even those costs show exceedingly handsome profits to the low cost producers. But it is obvious that these, without reduction in wages, will, on account of the termination of the war, be subject to very important reductions.

"The war costs appear in many instances to involve a heavy increase in the royalty for ore, or the assumed value of the ore in the ground. This increase did not represent an actual increase in cost so far as the producers of the ore were concerned, but simply represented a heavy additional profit. Yet this increased profit in ore appears to be included in the war costs upon which the figures have been based. The cost of coke has fallen substantially from $3 to $4 per ton, representing a saving of from $3 to $5 per ton of iron.

"The steel interests and the Industrial Board have proposed a price of $38.50 for steel billets and yet they have proposed prices for finished steel products which are wholly out of line with the price for steel billets. The differentials which the steel interests and the Industrial Board propose for the finished products as compared with steel billets are so great as to make the prices for the finished products altogether unattractive and altogether unjustifiable.

"If the average differentials for finished products as compared with steel billets during the 16 years preceding 1917, be increased by 50 per cent (to insure against any adverse effect upon the wages paid to labor), the resulting differentials and prices for the finished products would be as follows as compared with the prices actually proposed (per ton of 2,240 lb.):

	After adding 50 per cent to differential	Suggested new price based on 50 per cent increase in differential plus billet price of $38.50	Price fixed March 21, 1919, by Peek committee
Bars	$10.32	$48.82	$52.64
Bessemer steel rails	2.87	41.37	45.00
Galvanized sheets, No. 28	81.48	119.98	127.68
Beams	13.04	51.54	54.88
Wire rods	9.81	48.31	52.00
Tank plates	13.28	51.78	59.36
Black sheets, No. 28	40.67	79.17	97.44
Tin plate	83.84	122.34	156.80
Nails	23.69	62.19	72.80

"Messrs. Spencer and Powell pointed out that the cost of open-hearth rail was no greater than the cost of Bessemer rail since the cost and price of both sorts of billets were the same and, therefore, that the price of open-hearth rail should

* The Navy Department on May 13 opened bids from 11 steel companies on 14,000 tons of plates and shapes and found that the basic prices were all alike and corresponded to the prices announced by the Peek Committee. The Navy had rejected bids on this material submitted on April 4 because they were not on a competitive basis.

be no higher than the price of $41.37 above indicated for Bessemer rail, and that if the steel interests wished to encourage the purchase of Bessemer rail they should do so by making the price of Bessemer a differential under the price so arrived at for open-hearth rail rather than through increasing the price of open-hearth rail by $2, the amount of the old differential.

"The actual differentials during the year ending June 30, 1917, which represent as nearly as possible the conditions immediately prevailing prior to the great assumption of war activity by this government, are even less than the differentials for the 16-year period. The best estimates as to the actual operating costs of converting steel billets into finished products, even under war conditions, indicate that the differentials on the basis of 150 per cent of the 16-year period average shown above, will fully cover that additional cost and a substantial profit.

"Messrs. Spencer and Powell indicated a willingness on the part of the Railroad Administration to purchase for the time being at the suggested new prices based on 50 per cent increase in differential plus the billet price of $38.50 announced in March.

"The steel interests were unwilling to make any reduction in their price, and, in order to repel the argument that the prices for all other products were out of line with the billet prices, manifested a disposition now to claim that their own billet price of $38.50 was lower than it ought to have been.

"Another fact which the Railroad Administration regards as a significant indication of the unreliability of using war costs as a basis for current prices is that one important element in the war costs was the cost of the water carriage of ore, and this was especially burdensome with respect to some of the high cost producers. This condition has radically changed since the termination of hostilities has released so much shipping. As an illustration, the Bethlehem Steel Company has filed a claim against the Shipping Board for the use by the latter, during the war, of the former's ships which were desired by the steel company to carry ore from Cuba to the plant near Baltimore. The steel company claims that the actual cost of transporting ore was $1.96 per ton during 1918, while the Shipping Board's rate which the Bethlehem Steel Company paid during 1918 was $9.50 per ton. Hence, by the Bethlehem Steel Company's ability to get back its ships, there appears to be a saving of approximately $7.50 a ton for delivery of ore, which represents at least $15 per ton on pig iron, since it requires two tons of ore or more to make a ton of pig iron.

"The steel interests urged that their costs in March were unusually heavy notwithstanding the cessation of hostilities, but the representatives of the Railroad Administration claimed that these abnormally high costs at the present moment were due to temporary conditions of readjustment and ought not to be taken as a basis for prices designed to stimulate a general buying movement. It should be remembered in this connection that the Industrial Board justified its approval of the steel interests' costs for the month of October involving the elements which, as above pointed out, have so radically changed.

"After the most prolonged discussion, the representatives of the Railroad Administration still remained entirely satisfied that the reduced prices indicated by them could, and ought to be, adopted without affecting the wages paid labor in the steel industry.

"The uncertainty and hesitation which have been injected into this situation would never have arisen if at the outset Chairman Peek had been willing to accept as final the position which the Railroad Administration stated before the Industrial Board made its public announcement and which it has at all times felt forced to maintain.

But Chairman Peek has been so bent on justifying his own mistaken conception of his functions that he has been trying for weeks to get them accepted; and yet he has never succeeded in getting the support of the President or the cabinet, or the attorney general.

"In closing the discussions it is important that the totally erroneous impressions created by him, particularly in a recent speech before the United States Chamber of Commerce at St. Louis, be removed. The plan on which the board was supposed to operate was thoroughly discussed at a special meeting of the cabinet on February 3, and Mr. Peek stated in his speech that that meeting approved the plan of having the board determine prices and make them effective by the authorization of a governmental announcement. In this he is in error. The meeting distinctly declined to approve any plan for announcing prices at which the general public would buy, and the only plan which was approved, was a plan to bring about by voluntary action, a reduced level of prices at which the Railroad Administration would be justified in buying freely, and therefore the plan actually approved specifically contemplated that the board would act as a mediator between the producers and the Railroad Administration. The meeting of the members of the cabinet on February 3 was called and presided over by Secretary Glass of the Treasury Department and as indicating Mr. Peek's erroneous conception of the plan approved at that meeting, Secretary Glass telegraphed to the director general after reading Mr. Peek's address in St. Louis, sharply contradicting Mr. Peek's assumption that the President and the cabinet ever sanctioned the policy of price fixing engaged in by the Industrial Board.

"Mr. Glass stated that Mr. Peek had conveyed the impression that the Industrial Board pursued the exact course suggested by Mr. Glass' first cable to the President, whereas, quite the contrary was true; and the Industrial Board, under Mr. Peek's leadership, utterly perverted the suggested policy of those who initiated the movement for resumption of business activities, and brought the scheme into direct conflict with the federal statutes against unlawful agreements. Mr. Glass called attention to the fact that this was the very thing against which the President at the outset gave warning and precisely the thing that the members of the cabinet who had part in the initial conference refuse to countenance. Mr. Glass concluded by stating that although Mr. Peek had made it appear that his advocacy of unsatisfactory prices had the sanction of the President and cabinet and has been opposed solely by the Railroad Administration, the very reverse is true."

Judge Gary's Comment

Elbert H. Gary, chairman of the United States Steel Corporation, in commenting on Mr. Hines' statement, said:

"The statement of the director general, if it had been made after full acquaintance with the facts and figures and had been accurate in all respects, would not, in my opinion, have any bearing upon the exact present situation.

"On the present basis, cost of production, as shown on the books of the manufacturers, verified by the Federal Trade Commission, would not permit any further reductions in the present selling prices, without lowering the wage rate. Our subsidiary companies are strictly maintaining the scale of prices approved by the Industrial Board, and it seems to me that will be the attitude of other manufacturers, for the reason, if for no other, that the cost of production will not allow any further reductions in selling prices. They have voluntarily made two substantial reductions since the armistice was signed.

"I regret that opinions between the Railroad Administration and the iron and steel industry should have differed. The business relationship has always been pleasant, and we should like to see it continued without interruption."

Prior to the New York conference Secretary Redfield of the Department of Commerce had made public a letter to Mr. Hines stating that he had asked the Industrial Board to convey to the steel representatives the desire of the board, in which he joined, that nothing should be allowed to prevent an agreement and that if it was in their power to make reductions that would be acceptable to the Railroad Administration without disturbing labor or increasing prices to the public, the board would welcome such a conclusion, as it would relieve the tension on the business of the country. He also expressed the hope that Mr. Hines would do all in his power to bring about a definite agreement with the steel industry.

The acceptance of the resignations of the board members closed the chapter of the efforts of the Department of Commerce to assist in the readjustment of prices from a war to a peace basis. The coal, cement, and lumber interests had expressed a readiness to make price concessions through the medium of the board, but negotiations were postponed until it could be learned whether the Railroad Administration would buy at the prices announced. Since it has declined to do so in the case of steel the whole plan has been abandoned.

Chairman Peek of the board on May 10 issued a statement releasing all industries that had submitted themselves to the board, on the latter's invitation, from any obligation to the board. In this statement he said:

"In conducting its investigations the board found that very much higher costs of production, resulting from conditions brought about by the war, precluded the possibility of immediately making as large reductions as were thought possible without disturbing labor rates. Labor rates have increased from 85 per cent to as high as 140 per cent in the steel industry, and labor costs in even greater ratio, and as labor either directly or indirectly constitutes approximately 85 per cent of the total cost in many industries, it will be seen that as compared with pre-war levels, prices must necessarily be very much higher than formerly, unless a general liquidation of all values were effected, which is considered impracticable at this time or so long as the high cost of the necessaries of life prevails."

Plan Called Illegal

After the resignations of the board members had been accepted there was made public an opinion submitted by Attorney General Palmer in a letter to Secretary Redfield dated April 1, that the proposed plan of the board, "viewed in any aspect" was "unauthorized by law." This is now expected to serve as a warning against the submission of uniform bids by the steel producers. The plan was called illegal by the attorney general on the ground that it constituted price-fixing in violation of the anti-trust law.

The attorney general said in part:

"Of all forms of restraint of trade price-fixing agreements have been the most common. No rule of law is better established than that such agreements are illegal and void. * * * To bring a price fixing agreement within the condemnation of the law it is not necessary that it be in writing or that it be an express agreement. * * * Nor is it necessary, to make such an agreement unlawful, that the parties should be under compulsion by penalty or otherwise to observe it. Finally, it is no defense that such an agreement was induced by good intentions and may have some good effect.

"The foregoing considerations lead irresistibly to the conclusion that the proposed plan, viewed simply as an arrangement between private producers, would be in violation of the anti-trust laws. The Industrial Board, not being a creature of statute, has not been clothed by Congress with any powers which would remove contracts made by it from the operation of the Sherman act. It follows, therefore, that the legal defect of the proposed plan is not altered by the fact that it would be carried out through the Industrial Board.

"Lastly," said the attorney general, "in no less than 30 statutory provisions Congress has announced its purpose that the purchase of government supplies shall be governed by the competitive system.

"I am of opinion, therefore, that the proposed plan of the industrial board of the Department of Commerce, viewed in any aspect, is unauthorized by law."

In accepting the resignations of the board members Secretary Redfield, the only cabinet officer who has supported the board, said:

"That board was conceived in the spirit of unselfish public service and has so acted from the beginning. There has been no change in its viewpoint, policy or attitude from the beginning. No statement nor inference to the contrary has a basis of fact. It has had the widespread support of industry and commerce throughout the country. It has sought merely to serve and has been ready to consider all figures, to respect all facts and to reconsider any statement or conclusion in the light of further knowledge. Its mind has been open and its purpose was directed not to winning a controversy but solely and simply to serving the country. I believe it has developed standards of public co-operation which will be of permanent value."

Chairman Peek's Statement

Mr. Peek issued a statement criticising the administration for failure to support the stabilization plan after it had been approved and declaring it inconceivable that the Railroad Administration's objection was sufficient to justify the abandonment of the policy.

Mr. Peek said in part: "The plan to make an immediate reduction in the cost of living, to remove the cloud of buying uncertainty and to anticipate by several months the return to normal business conditions has been abandoned. The plan was very simple—'In voluntary co-operation with business interests to arrive at a level of prices upon which business activities would be more actively resumed, and the Railroad Administration and other spending agencies of the government would be justified in buying liberally.' In so doing it planned to study costs of production, to add reasonable profits, and to announce the resulting price as a fair basis for buying.

"Weary of the details of the controversy between the Railroad Administration and the board, the public will yet demand an explanation of the wrecking, apparently on the obstinacy of a single official, of a plan of such apparent national value.

"Throughout the baffling controversy the board has found itself checked by forces in opposition which it could neither understand, reason with, nor overcome, but which grew in strength until they rendered further progress impossible and forced abandonment of the plan. It is inconceivable that the unsubstantial objection to the price of rails alone was sufficient to justify the abandonment of a policy of such importance. Nor has the director general been alone in thwarting the purpose of the board. The secretary of the treasury has taken a stand in direct contradiction with his message to the President urging the creation of the board. The attorney general has rendered an opinion that the plan of the board contravenes the Sherman act, but the facts assumed as the basis of that opinion are so inconsistent with

the actual course of conduct of the board as to render the opinion inapplicable.

"In all this opposition the board has sought in vain for a substantial reason. It has urged the Railroad Administration, first to aid it by one single fact, or argument, to arrive at a lower price for steel, and second to name a price which the Railroad Administration would consider fair. The first suggestion has been met with a stubborn and haughty silence, the second with a suggestion of absolutism: 'We will name you the price only on condition that you agree in advance to urge it on the steel producers'—and this in the face of the unimpeached cost studies of the board. Acceptance of such a suggestion would shame the manhood of the board.

"The only answer has been that the steel price announced by the board is 'too high.' If 'too high' means that the Railroad Administration can force lower prices, by smashing industry, smashing labor, smashing the public interest and throwing production into the hands of the most powerful and lowest cost producers, the board agrees that the price is 'too high.' But it was precisely these results the board was set up to prevent and the case stands proved that lower prices without these results are impossible. Still the Railroad Administration persists and announces specifically that its only view of a low price is one that shall, by inherent attractiveness, induce buying not by the Railroad Administration alone but *also by the old railroad corporations* who are so ably represented in the administration by the director general himself and by Messrs. Lovett and Walters, who have headed the opposition to the board.

"That the administration would commit itself against the public interest merely to support the ancient and discredited railroad slogan, 'the public be damned,' is unthinkable. Yet after all it is the administration, not the director general alone, who had power to thwart the board. Thus, there is no question that the board was set up to do exactly what it has done, and was set up with the full knowledge and assent of the administration and was given godspeed upon its way by Mr. Glass.

"The irrelevant opinion of the attorney general is dragged in. Persistently the activities of the board are referred to as 'price fixing' and 'agreement on prices with the steel producers.' Price fixing has never been attempted by the board. In co-operation with industry it has studied costs, added reasonable profits and promulgated the result. No one was under the slightest obligation to demand or to accede to these prices. Nor was any agreement by the steel producers to sell at these prices ever sought. Distortion of this course of conduct to make it appear a 'combination in restraint of trade' is little short of absurd and is only a further confusion of the issue.

"Members of the Industrial Board are experienced business men untrained in the devious ways of partisan politics. They came to their present task without hope of reward or advancement, believing that the war-time adjournment of politics in national affairs of economic importance had been extended to cover the period of reconstruction. Acclimated to the wholesome air of that adjournment by service on the War Industries Board, they have become stifled by the impregnated atmosphere that has come with the armistice, and are leaving gainers only by the conclusion that the inspiration of the war was not sufficient to induce the administration to give over the business of politics for the business of government.

"They have been unable to penetrate the inky cloud in which the political squid has concealed its escape from support of the board in a position which for some unstated reason was politically undesirable. I can only admit the public to my own perplexity among the following conjectures:

"In the beginning, did the present opponents of the board fail to foresee the far-reaching results to be achieved and was the growing importance and power of the board's policy too powerful a political engine to leave outside the administration's arsenal and in the hands of a non-partisan board? Does the administration plan for 1920 a platform of state-socialism which it now finds inconsistent with the results achieved by the board? Or, after all, am I giving too much credit for an acumen that does not exist and is what the board has encountered merely the machinations of the old railroad guard as represented by Messrs. Lovett and Walters and imposed on a too-complacent director general, or on a director general too jealous of his own prerogatives to see beyond the confines of his little czardom?

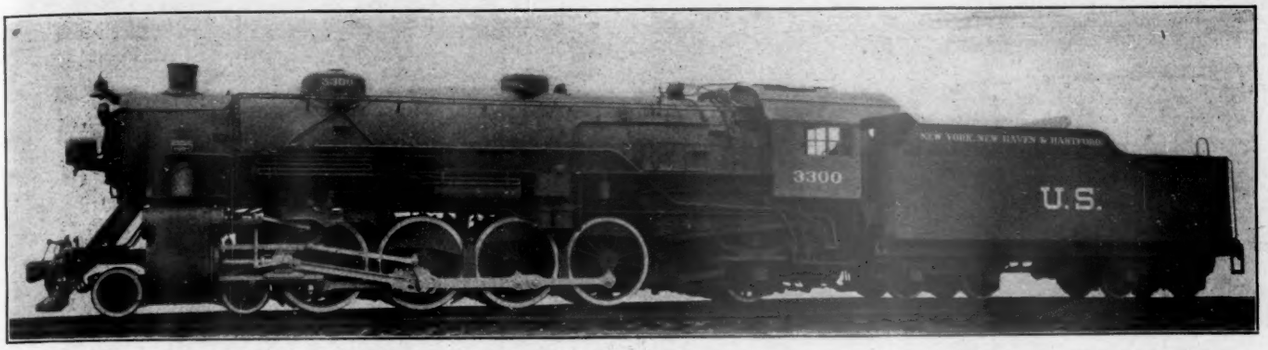
"The board cannot answer. It can only depart more in sorrow than in anger, and in great disappointment, from a lost opportunity to serve the country by a simple and sensible plan to reduce the cost of living and to return prosperity. In doing so it leaves a single message. The plan of the board was good. It is capable of accomplishing what it promised. The administration owes it to the nation to put that plan into immediate execution at the hands of some agency in which it can feel political confidence and sympathy."

Statement by Secretary Glass

Secretary Glass also issued a statement saying that the attempt made to fix minimum prices for the public seemed to him wholly indefensible and contrary to fundamental principles of economics, of public policy and of the law. "Surely the healthy restoration of industrial life and activity is not to be found in the perpetuation and exaggeration, months after the cessation of hostilities, of the artificial conditions which in war-time were tolerated as necessary evils," he said. "The original plan, which in its general features had my approval, was to endeavor to bring about a meeting of the minds, between the producers and those governmental agencies which had large purchases to make, upon bed-rock prices which would carry conviction that new enterprises might be undertaken with safety and the hope of profit. The Industrial Board, having failed to bring about such a meeting of the minds with governmental buying agencies, attempted to fix minimum prices for the general public, and thus did precisely that which it had been warned not to do. This action was promptly repudiated by me and the board was fully advised of the reasons and urged to mend its ways. Its subsequent efforts to force these minimum prices upon the railroad administration and its failure to recede from the action taken in attempting to fix minimum prices for the general public for a year, confirmed me in the view that the board was hopelessly committed to an unsound and dangerous policy.

There is scarcely one accurate assertion or sane deduction in all of Mr. Peek's intemperate screed; and to me it is now perfectly clear why there has been a sad ending of the movement which had its initial meetings in the Treasury, and which had for its purpose the revival of industrial activity through agencies and by methods that were not contrary to the statutes nor obnoxious to the elementary principles of economics."

The Chicago & North Western, before the Wisconsin Tax Commission, argues for the reduction of its preliminary assessment of $135,000,000 by $20,000,000. Unless this is done, declares T. A. Polleys, the road's tax commissioner, the state authorities will be exacting from the federal government approximately $300,000 of taxes not justly due to the state. A similar claim was submitted on behalf of the Chicago, St. Paul, Minneapolis & Omaha.



The U. S. R A. Standard Light Mountain Type Locomotive

The Administration Standard Light Mountain Type

The Last of the Government Designs to be Constructed; Weight 327,000 lbs., Tractive Effort 53,900 lbs.

THE FIRST of the Railroad Administration standard light Mountain type locomotives has recently been turned out at the Richmond works of the American Locomotive Company and assigned for service on the New York, New Haven & Hartford. This is the last of the standard designs prepared by the Railroad Administration from which locomotives have been built and locomotives of each of the twelve standards are, therefore, now in service.

These locomotives were designed on the basis of rail loads of 55,000 lb. on each driving axle. The actual weight in working order is 327,000 lb., of which 224,500 lb. is on the drivers. The engines produce a tractive effort of 53,900 lb., with a factor of adhesion of 4.2. In the table is presented a comparison of some of the more important dimensions and ratios of the standard light Mountain type with other moderate size locomotives of this type designed to meet conditions which would not permit of the use of maximum axle loads. With the exception of the Canadian Pacific locomotive few Mountain type locomotives designed for passenger service have been built with piston strokes greater than 28 in. It will be seen that the light Mountain type has cylinders of 30 in. stroke, which is also the case with the standard heavy Mountain type locomotive. Except for its greater tractive effort, partly due to the increased cylinder stroke and partly to the greater boiler pressure, the standard light Mountain type compares closely with the Chicago, Rock Island & Pacific Mountain type built in 1913. The heating surfaces compare closely, although the standard locomotive has a considerably larger grate than the earlier built locomotive.

COMPARISON OF THE PRINCIPAL DIMENSIONS OF LIGHT MOUNTAIN TYPE LOCOMOTIVES

Road	U.S.R.A.	Cent. of Ga.	C.R.I. & P.	Can. Pac.
Year built	1919	1919	1913	1915
Tractive effort, lb.	53,900	47,800	50,000	42,900
Total weight, lb.	327,000	316,900	333,000	286,000
Weight on drivers, lb.	224,500	209,500	224,000	192,000
Diameter of drivers, in.	69	69	69	70
Cylinders, dia. and stroke, in.	27 x 30	27 x 28	28 x 28	23.5 x 32
Boiler pressure, lb.	200	190	185	200
Heating surface, total, sq. ft.	4,121	3,649	4,117	3,667
Superheating surface, sq. ft.	966	961	944	760
Grate area, sq. ft.	70.3	66.8	62.7	59.6
Tractive effort × dia. drivers ÷ equivalent heating surface	667.7	648.0	623.5	625.0
Equivalent heating surface ÷ grate area	79.2	76.2	88.2	80.7
Firebox heating surface ÷ equivalent heating surface	6.2	5.8	3.4	5.5

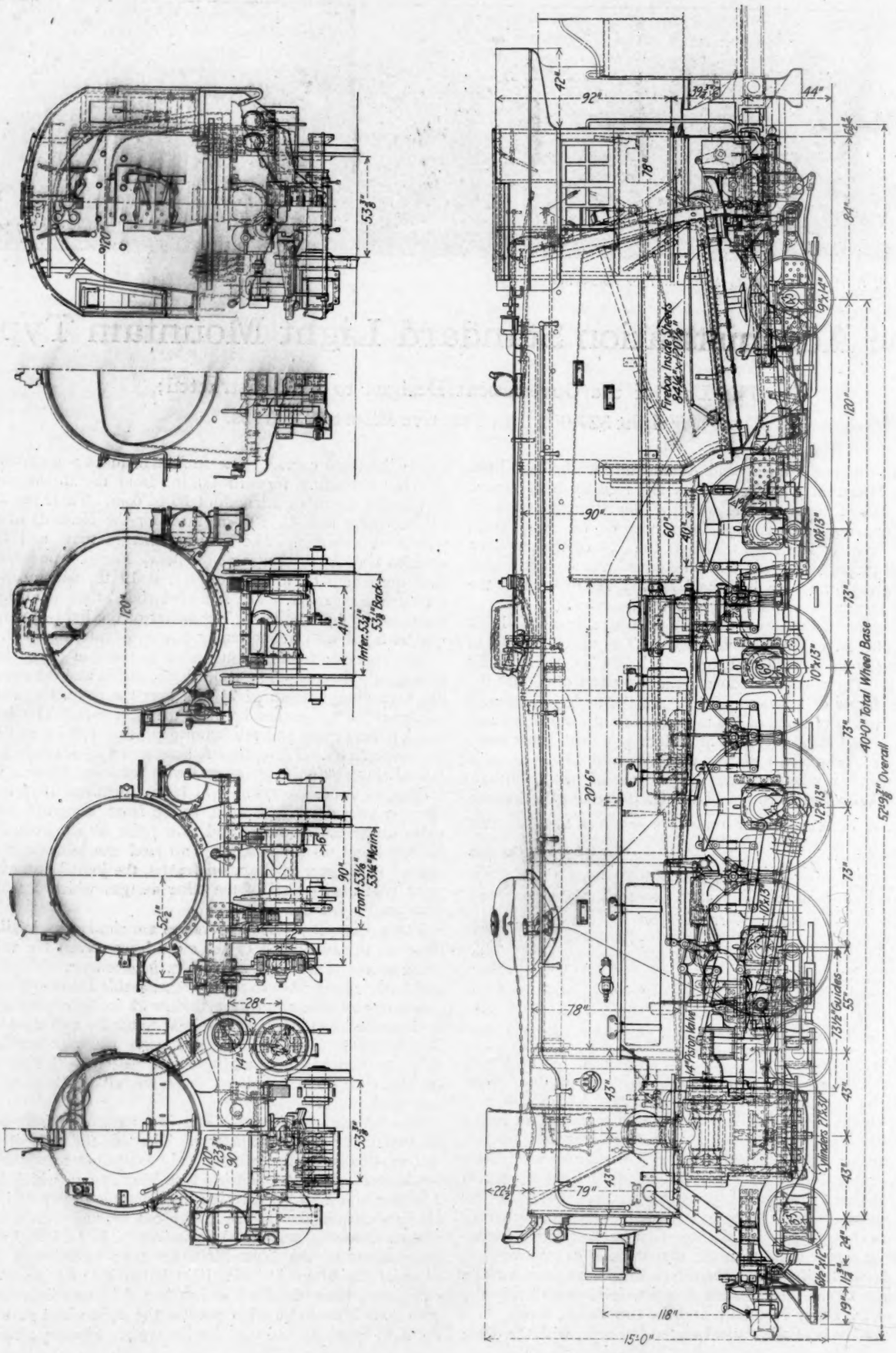
In design the light Mountain type locomotive is essentially the same as the other standard types, following closely the lines of the heavy Mountain and the two Pacific types.

The boiler is of the conical wagon top type, with the dome set on the third course. The firebox includes a combustion chamber extending forward 60 in. from the throat sheet, leaving for the tubes a length of 20 ft. 6 in. There are 216, 2¼-in. tubes and 40, 5½-in. flues for the elements of the type *A* superheater. The same number of tubes and flues are also used in the boiler of the heavy Pacific type locomotive, the length of which, however, is 19 ft., with a 38-in. combustion chamber. The size of firebox at the mudring is the same for both boilers. The boiler of the light Mountain type is fitted with a Shoemaker power operated firedoor.

The frames are similar in design to those of other single unit standard types. The width is six inches and the top rail has a maximum depth of 7⅛ in. over the pedestals, with a minimum of six inches between the pedestals. The lower rail has maximum and minimum depths of 4¾ in. and 4¼ in., respectively. The cylinders are carried on a single front rail of slab section, cast integral with the main frame. This rail tapers under the cylinder fit from a depth of 10⅝ in. at the rear to a depth of 9⅝ in. at the front, the width being 6 in. under the cylinders and to a point 30 in. back from the front end of the casting. Unit steel cradle castings are spliced to the rear of the main frames, the joint being of the same type used on all of the other designs which are fitted with trailer frames.

The cylinders, pistons and valves are similar in details to those on practically all of the other locomotives, the valves being of the piston type and 14 in. in diameter. The front and back cylinder heads are interchangeable between this locomotive and others having cylinders 27 in. in diameter, including the heavy Mikado, the light Santa Fe and the heavy Pacific types. The cylinder and valve chamber bushings, valve bull rings and packing rings, piston bull ring and packing rings and crosshead shoes are all of Hunt-Spiller gun iron.

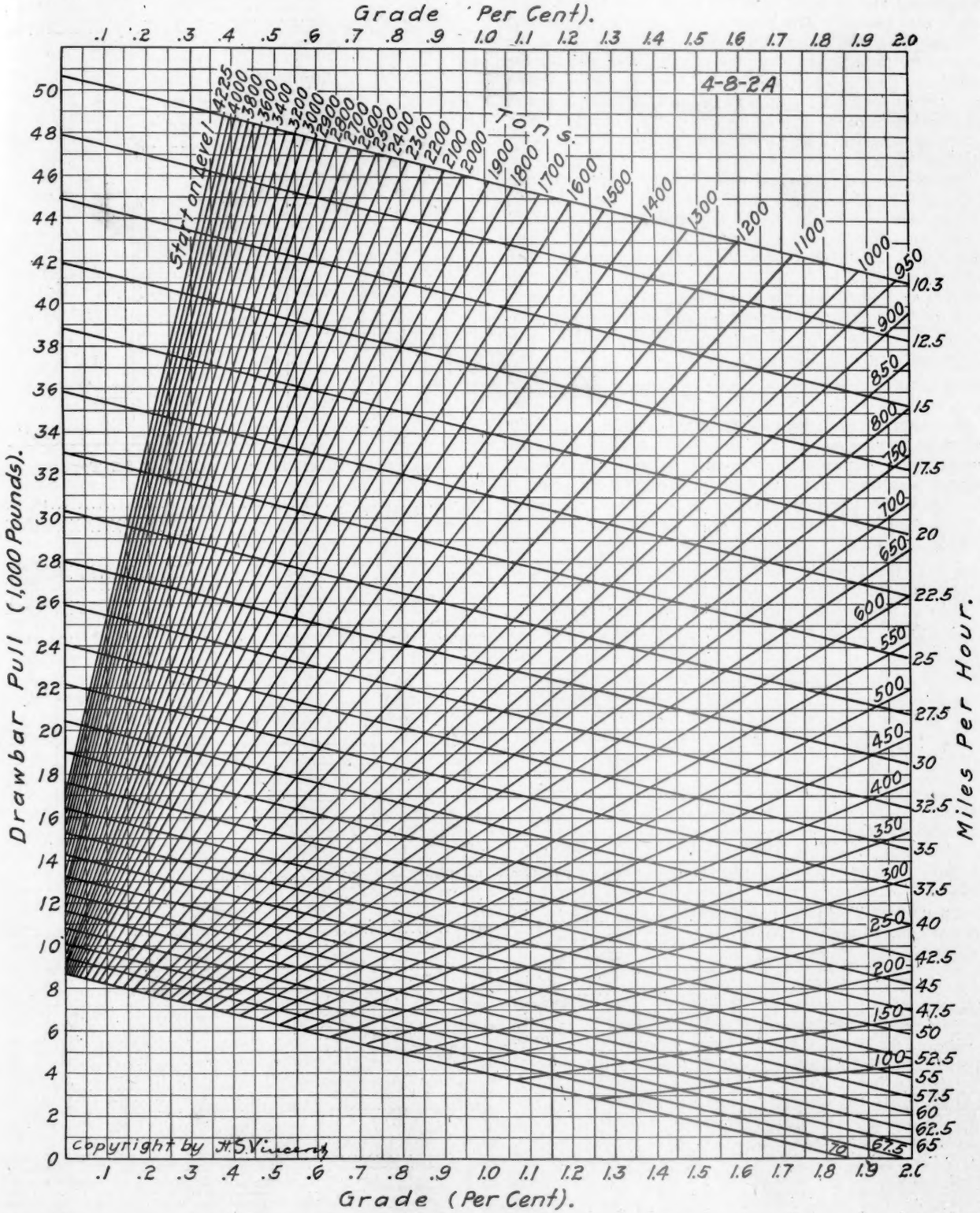
The main and side rods differ in no essential from those on any of the other locomotives. The side rods are of slab section, this being the rule the only exceptions to which are in the case of the two Pacific type locomotives, which have I-section side rods. There is a considerable degree of interchangeability in the side and main rod bearings between the various classes of standard locomotives. The back end main rod brasses of the light Mountain type interchange with those of the heavy Mikado, light Santa Fe and heavy Pacific types, while the front end main rod brasses interchange with both Mikado type locomotives, the eight-wheel switcher, the light Santa Fe and both Pacific types. Similar, although



Elevation and Sections of the Standard Light 4-8-2 Type Locomotive

not exactly the same interchangeability applies to the side rod bearings.

Driving boxes and axles are also of interchangeable design to a very considerable degree. The journal sizes on the front, intermediate and back pairs of drivers of the light Mountain type are 10 in. in diameter by 13 in. in length. With the exception of the main journals, those of the light Pacific, both Mikado types and both Santa Fe types have the same size and both axles and driving boxes interchange. The main journals of the light and heavy Mountain, heavy



Tonnage Rating Chart for the Standard Light Mountain Type Locomotive

Mikado, heavy Pacific and light Santa Fe types are interchangeable.

The tenders have Commonwealth unit frame castings and are carried on Commonwealth equalized four-wheel trucks. The tank has a capacity of 10,000 gallons, carries 16 tons of coal and is fitted with the Locomotive Stoker Company's coal pusher. The tanks are built up of ¼-in. and 5/16-in. plate with 2½-in. by 2½in. by ⅜-in. angles at the corners, for the attachment of the splash plates and for the crossties. Two T-irons of 4-in. by 3-in. by ⅜-in. section are used as horizontal stiffeners on each side of the water space and to these the ends of the crossties are attached. The cistern opening has a length of 96 in. across the tank and a width of 18 in.

The clearance diagram and wheel loading diagrams which are included were prepared by F. P. Pfahler, chief mechanical engineer of the Division of Operation, of the Railroad Administration. Actual weights are shown on the wheel loading diagram. The tonnage rating diagram was prepared and is copyrighted by H. S. Vincent. The curves of hauling capacity are constructed for a car resistance of four pounds per ton. The chart may be used for any other car resistance or for any combination of resistances by converting them into terms of grade.

1 lb. car resistance	= .05 per cent grade
1 deg. curve uncompensated	= .04 per cent grade

For example, find the tonnage which can be hauled in passenger service on 0.5 per cent grade combined with a five degree uncompensated curve at 40 m. p. h. The resistance of passenger coaches at 40 m. p. h. is 6.65 lb. per ton.* The equivalent grade is then:

$$0.5 + (5 \times .04) + (2.65 \times .05) = 0.8325 \text{ per cent.}$$

At the intersection of the ordinate for 0.8325 per cent grade with the drawbar pull curve for 40 m. p. h., we find 800 tons as the capacity of the locomotive.

A list of the specialties on all of the standard locomotives was published in the January 3, 1919 issue of the *Railway Age*, page 91. The principal dimensions and data for the light Mountain type locomotive are as follows:

General Data

Gage	4 ft. 8½ in.
Service	Passenger
Fuel	Bit. coal
Tractive effort	53,900 lb.
Weight in working order	327,000 lb.
Weight on drivers	224,500 lb.
Weight on leading truck	49,500 lb.
Weight on trailing truck	53,000 lb.
Weight of engine and tender in working order	519,000 lb.
Wheel base, driving	18 ft. 3 in.
Wheel base, total	40 ft. 0 in.
Wheel base, engine and tender	75 ft. 8½ in.

Ratios

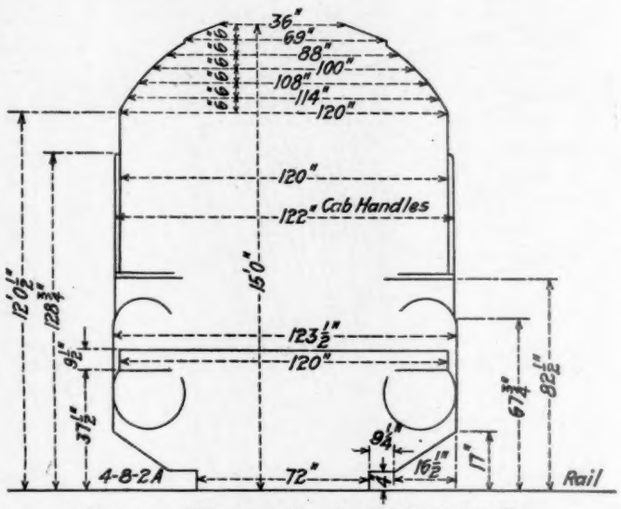
Weight on drivers ÷ tractive effort	4.2
Total weight ÷ tractive effort	6.1
Tractive effort × diam. drivers ÷ equivalent heating surface*	667.7
Equivalent heating surface* ÷ grate area	79.2
Firebox heating surface ÷ equivalent heating surface,* per cent	6.2
Weight on drivers ÷ equivalent heating surface*	40.3
Total weight ÷ equivalent heating surface*	58.7
Volume both cylinders	19.9 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	279.9
Grate area ÷ vol. cylinders	3.5

Cylinders

Kind	Simple
Diameter and stroke	27 in. by 30 in.

Valves

Kind	Piston
Diameter	14 in.
Greatest travel	7 in.

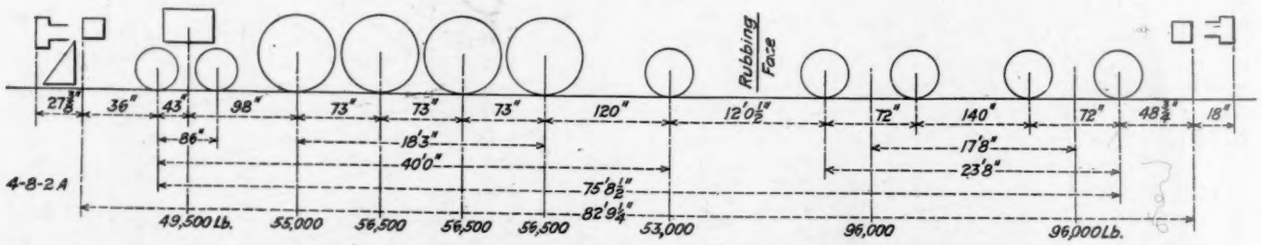


Clearance Diagram for the Light 4-8-2 Type

Steam	1¼ in.
Exhaust clearance	⅞ in.
Lead	¼ in.

Wheels

Driving, diameter over tires	69 in.
Driving journals, main, diameter and length	12 in. by 13 in.
Driving journals, others, diameter and length	10 in. by 13 in.
Engine truck wheels, diameter	33 in.
Engine truck, journals	6½ in. by 12 in.
Trailing truck wheels, diameter	43 in.
Trailing truck, journals	9 in. by 14 in.



The Distribution of Wheel Loads for the Standard Light Mountain Type

Boiler

Style	Con. wag. top
Working pressure	200 lb. per sq. in.
Outside diameter of first ring	78 in.
Firebox, length and width	120⅛ in. by 84¼ in.
Firebox plates, thickness	Tube and throat, ½ in.; others, ⅜ in.
Firebox, water space	Front, 6 in.; others, 5 in.
Tubes, number and outside diameter	216—2¼ in.
Flues, number and outside diameter	40—5½ in.
Tubes and flues, length	20 ft. 6 in.
Heating surface, tubes	2,597 sq. ft.
Heating surface, flues	1,176 sq. ft.
Heating surface, firebox, including arch tubes	348 sq. ft.
Heating surface, total	4,121 sq. ft.
Superheater heating surface	966 sq. ft.
Equivalent heating surface*	5,570 sq. ft.
Grate area	703 sq. ft.

Tender

Tank	Water bottom
Frame	Cast steel
Weight	192,000 lb.
Wheels, diameter	33 in.
Journals, diameter and length	6 in. by 11 in.
Water capacity	10,000 gal.
Coal capacity	16 tons

*See the *Railway Age* for October 4, 1918, page 631, for a table of passenger cars resistances for use with these charts.

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

Some Phases of Government Control*

Shall Railroad Labor Be Considered to Be Affected with a Public Interest as Is Railroad Capital

By Wm. Church Osborn

IT IS GENERALLY BELIEVED that the government took control of the transportation organization of the United States on January 1, 1918. Such is not the case. The control bill gave the government real control of only a part of the organization. It is true that the government assumed control of the physical property and the money of the railroads; the right to change rates, etc., at its pleasure. The government freed itself completely from the restrictions of the Sherman act and the Hepburn bill as to pooling, consolidations, etc., including the regulations of the Interstate Commerce Commission, all of which had for years been the accepted policy of the country in managing the transportation interests, but the government did not assume control of railroad labor.

A transportation system is a living organism. It gets its life from the men who run it and it works well or ill according as the men constituting the organization conduct themselves. It is a mistake to think of a railroad as the right of way, the rail, the engines, the cars, the terminals and the financial management with the bonds, stocks and balances in bank. As a fact, these things are less than half of a railroad. The other half is the working organization of men—from the president to the gate tender, from the traffic manager to the advertising agent—which runs the road. The flight of the Twentieth Century from New York to Chicago is made possible because each one of some thousand men performs his appointed duties at the stated minute. The people of the country will get good or bad transportation; will pay more or less for it, in direct ratio as the two million or more of ordinary railroad employees perform their duties well or ill.

The total operating revenues of the railroads for 1918 were $4,800,000,000; of this $2,400,000,000 was paid to labor, the rest went in materials, taxes and the rental. The dominating fact of government operation is therefore, that although the government took actual control of about 50 per cent. cost value of the transportation organization of the country it remained in the position of a private employer with reference to the remaining 50 per cent. of the transportation business, i. e., the human organization of the system. Mr. Kruttschnitt, president of the Southern Pacific lines, is reported to have said that if he had to choose between the return of a railroad without an organization, or of an organization without a railroad, he would take the organization. The control bill granted to the government no special powers of arbitration of differences with the railroad employees. It made no prohibition upon leaving the government railroad service without notice and without cause; it granted no coercive authority such as enlistment or the fixing of a penalty for failure in duties. It left the "right to strike" in full effect. It is therefore a misstatement to say that we have had government control of the railroads since January 1, 1918.

The cost of materials and supplies, the maintenance of the organization and the necessary payments for capital and taxes absorb to-day about 50 per cent. of the gross annual revenues. The remaining 50 per cent. is paid directly to labor. We have, therefore, about 50 per cent. of the railroad business under regulation and control and about 50 per cent. free. The question is whether an organization half regulated and half unregulated can endure.

The problem before the American people in settling our transportation question is no longer to check the rapacity of capital, or to control the autocratic tendencies of the operating officials, or to fix the nature of the facilities to be given to the public. Capital no longer regards a railroad investment as a profit maker and will be thankful if its existing investments shall return a moderate income. The once haughty managers of railroads now know their masters and agree to requests of national and state commissions on all sorts of details, from placing unnecessary brakemen on a train, down to the character of drinking cups permitted in the cars. They are ready to install steel equipment, terminals, block signals and any other desirable railroad facilities, provided they can obtain the money to pay for them. The great body of financial sentiment approves government supervision of the issues of railroad securities and is prepared fully to endorse the government making of rates, provided they will make a return upon the existing investment. The people may therefore feel that as to 50 per cent. of their transportation no serious obstacle stands in the way of a full control; as to the remaining 50 per cent. of transportation the situation is different. From the passage of the Adamson law, raising wages by Congress, under threat of a nation-wide strike, in the month of January, 1917, down to the settlement of the harbor strike in New York City in 1919 by the acceptance of the strikers' terms by the railroad administration, there has not been an instance where the demand for increased pay and reduced hours by the railroad employees has not been granted.

Since the passage of the Adamson law, viz., the period from January 1, 1917, to date, the pay of railroad men has been increased by successive stages so that the actual increase in pay in the year 1918 over the year 1916 would amount to over $900,000,000 and the estimated increase in 1919 over 1916 would be approximately $1,000,000,000. In order to understand these figures they may be contrasted with various other railroad items; for instance, the increase in freight and passenger rates in 1918 produced the sum of approximately $800,000,000. It is estimated that these excess rates, 25 per cent. on freight and 50 per cent. on passenger, will produce in the fiscal year from July 1, 1918, to June 30, 1919, the sum of $1,000,000,000. In other words, practically all of the increase in rates has been absorbed by the increased labor charges on the roads. Contrast again the payments to labor with the payments on account of capital and we find that the increase alone in labor is equal to the entire annual rental of the properties. That rental is fixed under the Control Bill at approximately $920,000,000 a year.

There is no mystery about who pays the railroad freight rates. They are paid first by the farmers, the manufacturers and the dealers, but they are passed on to the consumers and make part of the cost of living. The people pay the freight. The people pay excess labor charges just as they pay excess capital charges. A general railroad strike is therefore a strike to make the people pay more or grant easier conditions. A railroad strike stops industry and the food supply. Hence we are all afraid of it.

One great result of government operation has been to

*An address read before the National Institute of Social Sciences, April 25, 1919.

make it clear to the public that they have not to deal with an ordinary conflict between capital and labor. Capital is not at present involved or interested in the subject. It is probable that the readjustment will give capital little or no voice in rates or management. The question before the country is a larger one, viz., whether the 50 per cent. of railroad earnings going to labor shall be subject to regulation and control as is the remaining 50 per cent., or whether it shall be left to the laws of supply and demand and subject to the "right to strike." The government management has shown itself to be helpless in the face of an organized demand by a large number of voters and that tendency of government, being equally apparent both in England and France, may be taken to be a general characteristic and we must consider any plans for the future management of transportation with that feature in mind.

It is the general statement in Washington by senators and others in interest, that the roads may be turned back to private management but under far greater control than has existed heretofore. The labor question is an inconvenient question, certain to stir up trouble and arouse anger, but if the people are to have satisfactory transportation conditions, they must face the problem of the control of railroad labor as well as that of the control of railroad capital and operation. This is not a question for capital. As I have pointed out, capital for railroad enterprise has ceased to be speculative and profit making and is merely interest bearing. New capital can be had at market rates by making it secure. The subject of future capital requirements, however, is not germane to this paper.

There is a common assumption that the roads will be turned back to private owners without action upon the labor problem. As the roads are operated at a heavy loss under the existing conditions that proposal would mean placing upon private management the burden of exacting efficient service from labor and reducing payrolls to a point at least of transportation solvency. The result will be unco-ordinated efforts of a great number of different railroad managers, some strong, some weak, some vindictive, some easy, each considering his business as a separate problem and solving it as a special railroad problem without reference to the general labor requirements and conditions of the country. Doubtless, such a readjustment would be accompanied by costly and exasperating strikes. The public would be inflamed against the railroad management and much injustice and suffering would result to the men and to their families.

A more ideal way, and one more consonant with the views of an idealistic administration, would be to require the Interstate Commerce Commission to inquire into and regulate the surroundings and proper compensation of railroad labor, both wages and hours, as compared with the general labor conditions in the country. Upon that commission should sit men familiar with the conditions of railroad labor and also men familiar with the interests of the shippers using the railroads, such as members of chambers of commerce and the agricultural industry of the country. If possible, some members should be found who really represented the consuming public upon whose broad shoulders ultimately rests the burden of supporting the transportation of the country. Indeed, the balance of power on the commission should rest with those who have no interest except to second the general welfare, who can carry a just proportion between the special interest of the railroad employees and the general interest of the farmers, the laboring classes and the salaried people throughout the country. If the public desires to control its transportation interests, and has determined through the commission what is a fair return for railroad labor in its different classes, and has made provision for a just revision of the scale from time to time as may be required by general conditions in the country and in the industry, the public must, to be consistent if for no other reason, face the question of how the award of the commission shall be enforced.

Shall railroad labor be considered to be "affected with a public interest" as is railroad capital? Shall entry into the service be made subject to certain fixed conditions with regard to leaving the service, such as thirty days' notice, the refusal of re-engagement in case service is terminated without adequate cause? Shall compulsory arbitration be adopted? Shall it be a misdemeanor to leave the service in a strike against an award adopted fairly and after due consideration? How can the railroad service be made attractive by way of old age pensions, better facilities for living, etc.? Such are the problems which the American people face in settling their transportation question. If we attempt to turn over the management of the 50 per cent. of the problem to private control, we must face difficulties of a character far more serious since the changes brought about by the war, than those which existed previously. The owners of the railroads do not wish to take them back under existing conditions. There are many who think that the proposal to leave the readjustment of these matters to private control would bring about a general bankruptcy of the transportation systems of the country. As a matter of fact, the government control is bankrupt to-day. In spite of the fact that it has raised railroad rates a billion dollars, its management is a half billion dollars behind its obligations. Government operation will require a billion appropriation by July. About a quarter of the war tax levy for this year besides another billion in transportation tax are thus due to government operation. Were it not for the taxing power, the government administration would have to seek refuge in a receivership. This condition is largely caused by the increased cost and the growing inefficiency of labor under government control, and makes plain the necessity of attacking with moderation and fairness but determinedly the problem of securing effective regulation of railroad labor in the United States.

The problem is not one of labor and capital. It is one of the relation of one branch of labor to the other labor, industries and interests of the country, for railroad rates touch everyone in the United States. There is no work in which men take such an intense and loyal interest as the railroad men take in their jobs. There is no class from whom loyal service is so essential to the public interest, because of their direct touch with the public both in passenger and freight transportation. There is no class of labor for which the strike is so tempting and so potent a weapon. A transportation strike is a blow at the food supply of the country and paralyzes all industry by withholding material and shipments. It would be an indictment of our courage and our collective intelligence to leave this desperate remedy of a transportation strike as a temptation to the railroad workers and as a menace to the general public.

The discussions in Congress and in the press have avoided the subject of railroad labor. There is a general readiness to let some one else bell the cat.

Railroad operatives are a very fine body of men. Their work takes them away from home and involves some risk. They are well entitled to good pay and good hours. But in the interest of the public they must submit to steady discipline and be held to it. The same interest requires that its food and material supply be not interrupted, and that its freight charges be not unduly raised.

Surely some method can be found, fair alike to the railroad employees and to the general public, which will solve the question indicated in the foregoing pages, upon the grounds of absolute justice and equitable treatment relatively to other industries and interests in the country.

Some Modern Tendencies in Roundhouse Design*

Economic Studies of Engine Terminals Demonstrate the Advantages of Permanent Construction

By Exum M. Haas
Railroad Specialist, The Austin Company, Cleveland, Ohio

An engine terminal is a clearing house for motive power, hence anything done to obviate delays tends to increase the traffic-carrying capacity of the road without increasing the fixed charges. The tremendous increases in traffic, operating charges, and hauling capacity of locomotives and their cost have proportionately increased the demand for full utilization of a locomotive's earning power. Mere minutes saved on each locomotive handled, when multiplied by the total number of locomotives of a given road, and reduced to money, will finance unbelievable improvements.

I refer to this phase of the engine terminal problem to indicate that a road can afford to pay for the most efficient facilities. As a matter of fact, a 100-engine terminal can be built at present day prices, and fully equipped, for $660,000. This would result in annual fixed charges of about $69,300, at 10½ per cent for interest and depreciation, or at about $2 per engine per day. For a terminal of this size, a 20 to 25-stall roundhouse would be required. Assuming 24 stalls, the house would cost about $220,000, or about one-third of the terminal cost. This amount would provide a roundhouse, equipped with all the modern labor-saving facilities, and it could be so constructed as to reduce depreciation to a minimum. For instance, a reinforced concrete structure would carry a rate of about 2½ per cent for depreciation, whereas a brick wall, wooden frame and roof structure would carry at least a rate of 5 per cent.

While the weight of locomotives has increased about 100 per cent, the cost has doubled. This also emphasizes the need for better facilities for the protection of the motive power. A locomotive is not a fire risk in itself, but when it is placed in a wooden roof roundhouse it certainly becomes one.

Some roundhouses are quite important running repair shops; hence anything incorporated in the design that will reduce the time to clear a locomotive should be adopted. Of course, there is an economical limit to the amount that can be spent, but that need not worry most of us, because there is so much room for improvement at most terminals that we would find it difficult to reach the limit of cost. For instance, engine terminal costs varied in 1918, so far as my knowledge goes, from $25,000 to $50,000 per stall of house capacity. The roundhouse proper has varied in cost from $6,000 per stall, with lighting, heating and plumbing, to $22,000 per stall. Both of these figures are high for the types of construction used, because of the abnormal labor and material market conditions prevailing in 1918, but the cost relation would hold even in normal times. On the other hand, from what I know of the labor-saving facilities provided in the higher-priced terminal and the permanence of its construction, I believe the mechanical department will have no difficulty in justifying the greater investment.

The Question of Labor

Another of the broader questions affecting roundhouse design at present is labor. This concerns the quantity and class of help available, and the working conditions and wages. Under prevailing industrial conditions intelligent labor has obtained employment at higher wages and with more satisfactory working conditions than are commonly found in and about a roundhouse. The roundhouse design must meet this form of competition or the quality of labor will fall below its present standard, and roundhouse labor is none too intelligent now.

Conditions in the average roundhouse built 20 years ago were not conductive to efficiency or economy. Poor day and night illumination and a lack of proper handling and machine tool equipment not only reduced the capacity of the house for clearing locomotives, but resulted in serious delays. On the other hand, the shortage of desirable help and the correspondingly higher prices that must be paid to obtain good men, make it important that all the facilities necessary and consistent with economy be provided to increase the production per man. The increased use of bridge and jib cranes in roundhouses is evidence of an appreciation of this fact. The substitution of the electric hoist for the truck and driver drop pits is another example. Improved daylighting in the working areas, and better heating and ventilation are also examples of the tendency to improve roundhouse conditions. Paved floors and walks, attention to good drainage, all add to engine terminal efficiency, and do not materially increase the fixed charges.

Modern Types of Construction

Modern roundhouses divide themselves into three classes—the brick wall, wood frame and roof; reinforced concrete frame and roof, and a combination of steel frame and reinforced concrete structure. In one or two instances, concrete frames with wooden roofs have been built to reduce first cost, and in others reinforced concrete unit construction was adopted. The brick wall, wooden frame and roof construction has been most generally used because of its cheapness.

A roundhouse located at an unimportant terminal, housing engines that are comparatively small, is usually of simple design. The present tendency, however, is to increase the height to improve daylighting and ventilation. Houses of this type should be built of slow burning construction throughout—nothing less than 2-in. sheathing, and preferably 3-in. on 6 in. by 12 in. rafters—and all S-4-S and heavily coated with a fire-resisting paint.

On many roads the frequent post spacing has been found objectionable. This was the case with the New York Central Lines, and a 64-ft. truss has been substituted in the working area for the columns and beams. These trusses were formerly of heavy timber construction, but are now built up of bolted planks. The reason for this change was to cheapen the construction without reducing the quality of the lumber. This house has a one-bay portal way, with a lean-to at the back of the house. The lean-to in the rear not only provides a working aisle, but also permits the locomotives to be shifted over the driver and truck drop pits. There is some difference of opinion regarding the lean-to, but it is undoubtedly a cheaper construction than if the trusses had been carried the full width of the house.

In but comparatively few instances have the reinforced concrete houses, which are now being quite generally used, followed the same section as the wooden frame roundhouses.

*Abstracted from a paper presented before the Western Society of Engineers, Chicago, May 12, 1919.

Generally speaking, however, they have been of the monitor-type construction, varying principally in the number and spacing of the columns. For instance, Philadelphia & Reading has built a house of three-bay construction, two low bays on each side of a monitor section. The interior columns are all structural steel encased in concrete. The reason for adopting this type of column was to permit the installation of a jib crane. The roof is a combination floor tile, T-beam construction to form an insulating medium against temperature changes and condensation. All sashes are of steel with pivoted ventilating sections. As an aid in ventilation, five permanent slot openings were provided at the ceiling line between each set of columns in both sides of the monitor and through the back wall. In addition, of course, there is the smoke jack and the opening around it.

I believe the first instance where a bridge crane was installed in a roundhouse was that in one built by the Baldwin Locomotive Company at Philadelphia. This was built for repairing locomotives, and is equipped with two cranes, the larger of which is of 50 tons capacity. Among the first of the bridge crane types of houses built by a railroad was that of the Pennsylvania Railroad at Altoona, Pa. It was constructed in 1902 and consists of 52 stalls, handling an average of between 250 and 350 locomotives daily. The head room in the crane section is about 30 ft. and the crane capacity is 12½ tons. It is interesting to note that an analysis of roundhouse crane requirements on the Pennsylvania Railroad made recently developed the fact that the maximum load that a crane would be required to handle was about 8½ tons. This meant that a 10-ton crane would be adequate for all purposes.

Another house along similar lines, and one which has been described quite frequently in technical journals, and railroad engineers' hand-books is that of the Western Maryland at Hagerstown, Md. This house is a steel frame construction, encased in concrete. Woven wire mesh was wrapped about the steel, and the concrete put in place by the Gunite system. The roof slab is 3-in. concrete with Hyrib reinforcing. It is of double monitor construction, permitting daylight to enter at three points in addition to the back wall. In connection with steel frame houses, I would call your attention to the fact that built-up columns, girders of heavy section, are being used as the frame in the new houses recently built by the Pittsburgh & Lake Erie. This company believes that proper attention to painting will give unusually long life to these steel frames.

The type of house recommended where repairs are light has a reinforced concrete frame with a column spacing that results in economical concrete beam construction. The roof slab is flat on the under side, and is formed with 8 in. by 24 in. floor tile, and 4 in. concrete T-beams. This provides an insulated roof and one which is just as cheap to construct as the plain slab. The location of the monitor windows is such that it will throw daylight into the working area. In addition, the sash area in the lean-to at the back of the house is large. Provision has been made for omitting one set of columns in the drop pit section. This is done to provide a clear floor area between the pits for removing wheels from the drop pits to the back of the house. Permanent openings 4 in. by 18 in. in section at the front and rear of the monitor and just below the roof slab will take off the gases which collect at those points.

So far as we can learn, the life of steel sash in a roundhouse is somewhat longer than of wooden sash in the same location, and it is just about as cheap. If it is kept well painted, steel sash has the additional advantage of not swelling under excessive moisture, and the ventilators are just as readily operated in the winter months as in the summer.

In houses where heavy repairs are made a crane of approximately 50 ft. span should be provided which, with a slight shifting of the locomotive, will reach any of the heavy repair parts which have to be handled. The height of the crane rail should be 26 ft. 6 in. above the floor line, which is sufficient to permit of the crane removing the cab without striking other parts of the locomotive. This height also greatly facilitates all crane movements. In a house with a craneway the objection may be raised to the fact that smoke and gases flow freely from the locomotive and fill the entire monitor section. In other words, the crane installation does permit the installation of the usual smoke jack. It has been found in houses of this section that the high monitor and the installation of a large ventilator or jack in the roof over each stall does not result in an objectionable accumulation of gases and smoke. In the winter time, and even in the summer, the fan in the hot blast heating system can be kept running to force out the gases.

I also want to call attention to the growing tendency to substitute the electric hoist for the truck and driver drop pit. In addition to reducing liability of accidents it removes wheels more quickly and cheaply. While this hoist is sometimes installed in the roundhouse, its proper location is in the back shop. In any case, the back shop should be connected with the roundhouse by a passageway, lined up with the turn-table, so that the dead locomotive can be pushed through the house into the back shop. With the electric hoist in the shop section, the removal of wheels is under proper supervision, and the handling of repair parts to and from the various machine tools is for but a short distance. Placing the hoist in the back shop also releases a stall for regular roundhouse service. Serious objection to the drop pit has developed in recent years, owing to the extremely heavy locomotives and to the declining quality of roundhouse help. While accidents due to jacking up the locomotives for the removal of wheels do not occur frequently, there is always the liability, and it has greatly increased with the failure to obtain intelligent labor.

Other Details

With the curved roof in a roundhouse the valley construction does not collect drifting snow like it does in a rectangular building. The wind has a sweep at the house from practically every direction, and those who have had long experience in roundhouse maintenance advise that they have never seen a great accumulation of snow on the roof. By pitching the monitor section to the rear of the house, as well as the lean-to to the back, practically all of the roof drainage is carried to a point where it does not interfere with the operation of the house.

Two types of roundhouse doors are quite generally used—a two-leaf steel-frame, wooden swinging door, and a rolling wood slat door. The former is the most popular because repairs are more readily made. The question is frequently raised whether or not it is desirable to provide sash in the door or in a transom over the door. Sash in the door permits lowering the roof level, but to some it is objectionable because the rough usage results in frequently broken glass. Daylight at the front of the house is not so essential, and all that is really needed may be had through small transom sash. On the other hand, it has been found that most of the blows which would break the glass in the door would break a wooden panel, and the glass is more readily replaced than the wood. For that reason, the glass area in the doors is made quite liberal in the houses built by a number of roads.

Another tendency in roundhouse design and construction which has come into more general use in the past few years is the substitution of the hot blast heating system for the pipe coils or other forms of direct radiation. A hot blast heating system installation costs very little more than a direct system, and it has the additional advantage of providing forced ventilation in the house, which is often very neces-

sary. At first the selection of too low fan and radiation capacity resulted in the indirect system being unsatisfactory. This has been corrected, and the fan may be speeded up in extremely cold weather to raise the temperature for thawing out frozen locomotives quickly.

Thirteenth Engineers Returns to Chicago

THE GREATEST RECEPTION given to any organization of returning soldiers at Chicago was given to the 13th Railway Engineers on May 12. Its welcome to its home town was unequaled in point of enthusiasm and spectacular expression in the after-war history of the city. Approximately 100,000 people banked Michigan boulevard on both sides and maintained a bedlam of noise as the regiment paraded in platoon formation. Employees of the six railroads centering in Chicago, from which the 13th Engineers was mainly recruited, were organized in groups along Michigan boulevard to welcome the men. Major General William M. Black, chief of the United States Engineer Corps; Colonel R. D. Black, general staff, one of the organizers of the 13th Engineers; S. M. Felton, president of the Chicago Great Western and father of the 13th Engineers; W. L. Park, federal manager of the Chicago Great Western and chairman of the reception committee; the federal managers of the six roads from which the regiment was recruited and other prominent railroad men in Chicago occupied the reviewing stand on Victory Way. Major General Leonard Wood, who was to have reviewed the troops, was caught in the crowd at one of the street intersections and was unable to pass.

A majority of the regiment arrived in Chicago on Sunday night and after being permitted to go to their homes assembled at dawn and marched to the Coliseum where thousands of relatives and friends welcomed them home. At 11:30 the men were again assembled and as they turned into Michigan boulevard for their parade, engineers on the Illinois Central and other railroads in Chicago opened their whistles until the parade had passed from Victory Way on Michigan boulevard into the loop district. The din created completely silenced the famous band of the 13th Engineers. Flower wreaths were hung over the shoulders of Colonel C. L. Whiting, in command of the regiment, battalion commanders and company officers, and a company of girls scattered roses on the pavement in advance of the men. Immediately after the parade the men were taken to one of the large hotels where they were dined and entertained.

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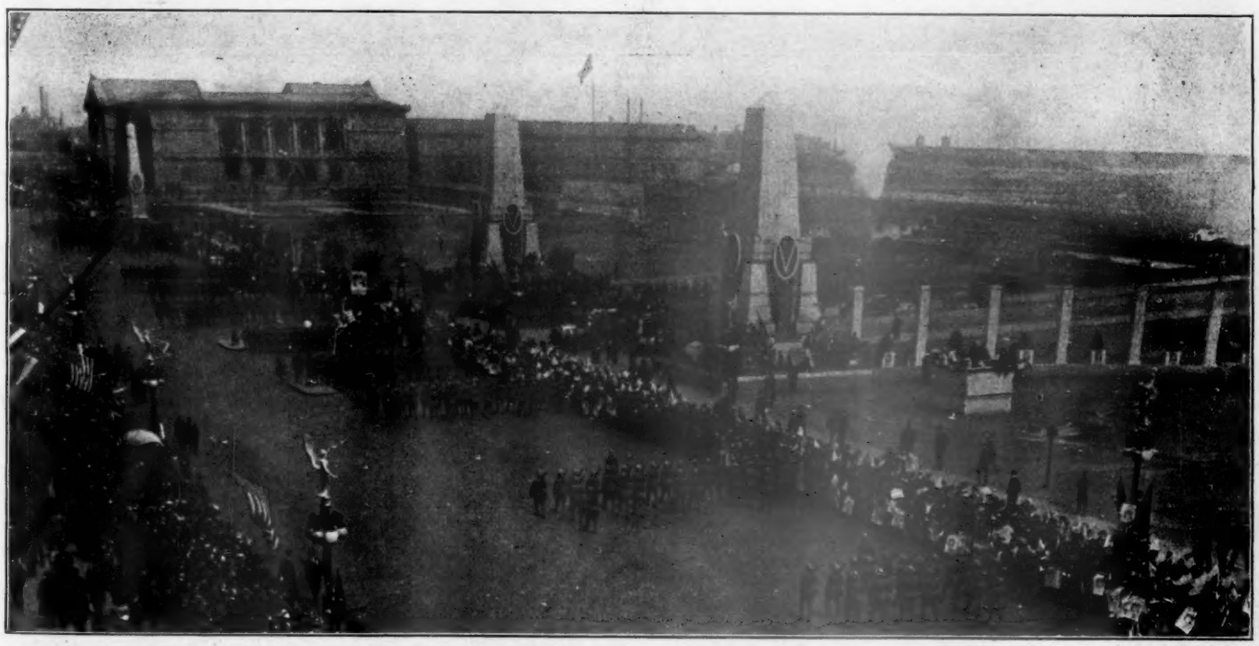
Officers in Command of the Regiment

Major General Wood in addressing the men after this banquet made an appeal for the formation of a strong national policy of preparedness and urged the men to establish conditions to prevent another war.

Mr. Park, after welcoming the men on behalf of the middle west railroads, read a letter from Governor Lowden of Illinois, whose illness prevented him from attending and



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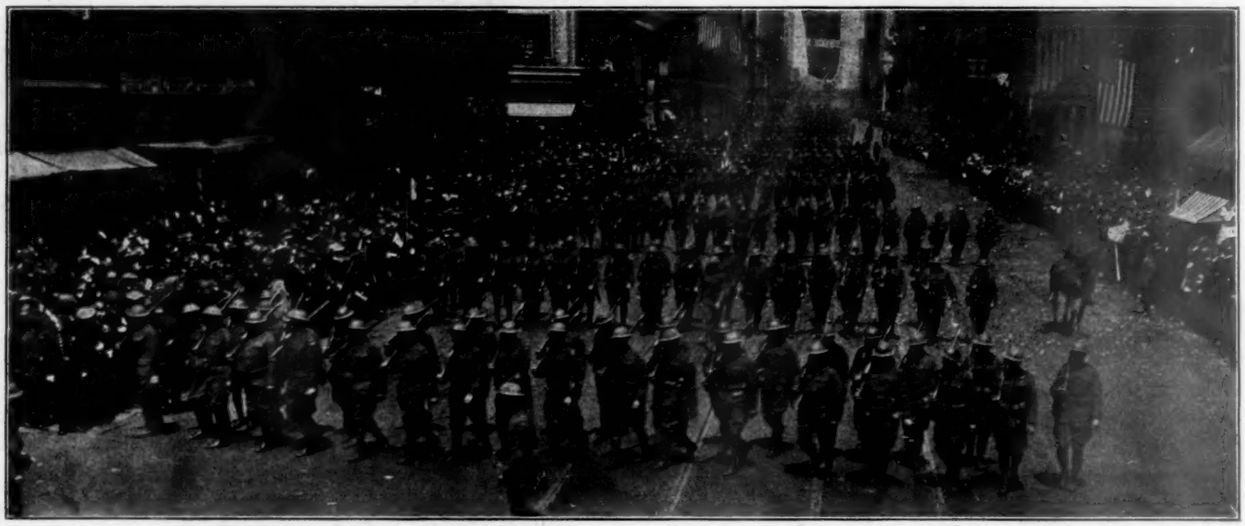
Thirteenth Engineers Passing Victory Way on Michigan Boulevard

added that every man in the 13th Engineers has his position on his old railroad waiting for him. A cordial welcome was also extended to the men by Major General Black and S. M. Felton and praise for the work the men had done in France was voiced by Colonel Whiting. Colonel Black, who was transferred from the regiment soon after their arrival in France, was then called upon by the men for a speech and told of his pride in having once been a member of the regiment.

The men entrained at three o'clock for Camp Grant where they will be demobilized.

The history of the regiment incorporated in the main report written by Captain L. E. Warner, regimental historian, to the Engineer Staff, American Expeditionary Forces, has been printed by the reception committee and is to be distributed to the men. A silk embroidered replica of the official regimental insignia with each man's name embroidered thereon is also to be sent to the men as soon as it can be prepared.

Permanent organizations to preserve the 13th Engineers have already been started, one for the officers of the regiment and the other for the enlisted men.



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On State Street

Orders of Regional Directors

STOREHOUSE DEVICES AND PRACTICES.—Supplement 2 to Circular 85 of the Central Western Regional Purchasing Committee outlines a list of special appliances, devices and profitable practices reported by various regions to the Stores Section of the Division of Purchases.

Weekly Report of Delayed Loads.—Order 199 of the Southwestern regional director orders a weekly report showing all loaded cars on hand on each Wednesday, which cars have been on hand 15 days or more. This report will show point of origin, contents, consignee, etc., and the reason for the delay.

Free Transportation for Witnesses.—Supplement 50 to Circular 20 of the Northwestern regional director authorizes interstate passes for witnesses appearing on behalf of the director general in any case against the railroads under federal control in which the director general is interested.

Per Diem Settlement.—Supplement 3 to Circular 78 of the Northwestern regional director states that previous circulars providing for the assignment of non-federal controlled roads to roads under federal control for the purpose of settling car hire accounts does not apply to the following classes: (a) roads found to be plant facilities, (b) roads receiving allowances on a plant facility basis under Section 15 of the Act to Regulate Commerce, (c) roads which do not participate in joint through rates either directly or through absorption of regularly published and filed switching charges and which do not receive any allowances, and 2, roads found to be industrial common carriers. Instructions are provided for handling the per diem settlement with roads which fall under these classes.

Distribution of Light Capacity Box Cars.—Supplement 1 to Freight Car Distribution Notice 10 of the Northwestern regional director states that box cars of less than 30 tons capacity may be utilized as follows: (a) cars belonging to other regions may be loaded to or in the direction of the home road and accepted in interchange provided the load takes the car directly to the home road or to a road in the same region; (b) cars belonging to railroads in the Northwestern region may be loaded and accepted in interchange provided the load takes the car directly to a point on the home road and (c) cars belonging to roads not under federal control may be loaded and accepted in interchange when consigned to any point on or in the direction of the home road.

Interstate Commerce Commission—Defense in Handling of Formal Complaints.—Circular 209 of the Southwestern regional director states that henceforth the responsibility for the defense of rate cases before the Interstate Commerce Commission, also the compliance or otherwise with the orders of the commission, is placed with the traffic assistants of the several regions, and outlines a plan for defense of these formal complaints.

Interest on New Work During Construction.—Circular 207 of the Southwestern regional director gives directions similar to those in Eastern Region Circular 2700A714, noticed in the issue of the *Railway Age* for May 9, 1919, page 1138.

Improper Billing of "Order" Shipments.—Order 200 cancelling Order 125 of the Southwestern regional director calls attention to improper billing of shippers' order shipments. Grain, lumber and other commodities are being sent to the principal markets without sufficient information as to the person who is to be notified.

Japan Desires American Co-operation in the Far East

An Interview With Baron Goto, One of Japan's Leading Statesmen and Formerly Head of Its Railways

"IF BY SECURING PRIVILEGES and succeeding to the German rights over the railroads in the Shantung province of China, Japan could be called aggressive, there is no nation which could not have been called aggressive toward China. The development of China's natural resources for the mutual benefit of China and Japan cannot properly be called aggressive in any way." This is the translation of a statement in Japanese by Baron Goto, one of Japan's leading statesmen, to a representative of the *Railway Age,* who called on him at his hotel in Washington on Tuesday last. In speaking to the representative of the *Railway Age* through an able interpreter, Akio Kasama, of the Japanese foreign office, the Baron sought to emphasize two things—one, the idea that Japan is trying to carry out a plan of assisting China to make the most of her tremendous resources of coal and iron and in the way that will prove of most benefit to China and Japan, and second that Japan is trying to work out this problem with the co-operation of the only other nation that is at present on a firm foundation in the Far East, the United States.

Baron Shimtei Goto is one of Japan's leaders in every sense of the term. He has been a member of the Japanese cabinet on a number of occasions and as president of the Japanese Imperial Railways was the man who perhaps did the most to bring that railway system to the point where it is now classed as one of the best operated in the world. The Baron is now on his second visit to this country —the first visit having taken place about 18 years ago. He is traveling at present in a private capacity, principally to investigate America's mobilization for war and its demobilization after the war. He has been especially impressed by America's industrial mobilization and is of the opinion that this was perhaps the most important factor in attaining the final victory in the war.

President of the Japanese Railways

The Baron was, about 18 years ago, civil governor of Formosa, and as such built the railways of that island. He was later president of the South Manchurian system and in his year of office there rehabilitated those lines. One of the large parts of this work was to change to standard gage the 5-ft. gage railways which were taken over after the Russo-Japanese war as well as the light railway feeders which now form an important part of the South Manchurian Railways. It is of special interest to Americans that in rehabilitating the lines he introduced American standards almost throughout to such an extent that Americans traveling over the Chinese Eastern and changing to the South Manchurian lines at Changchun, almost get the impression that they have come upon a section of United States.

Baron Goto then returned to Japan and soon entered the Japanese cabinet as minister of commerce and was also chosen president of the Japanese railways—a position which he held for nearly 10 years. Still retaining his position as head of the railways, he was later made minister of home affairs and then was given the important portfolio of minister of foreign affairs. He resigned from the cabinet about a year ago, but continued in an advisory capacity as a member of the supreme council of foreign affairs—a temporary body made necessary by the war. That the Baron will again return to the cabinet on his return to Japan there seems no question. It is in fact not unlikely that he will eventually attain the premiership, itself.

Japan, the Baron said, is endeavoring to co-operate in its work in China with the United States—Japan and the United States being the only two countries that are at present in a strong position in that part of the world, now that Russia has collapsed and China is in a state of revolution. This co-operation has already been manifested in a number of ways not the least important of which is the agreement made between Japan and the United States concerning the Chinese Eastern Railway or that part of the Trans-Siberian which crosses Manchuria to Vladivostok. This agreement was brought about largely through the efforts of Baron Goto who conferred on the subject with Mr. Morris, the American ambassador to Japan. Baron Goto emphasized the importance of this agreement as helping to preserve the peace of the Orient and as being one step to show the world how eager Japan and the United States are to stick to their mission of co-operation in the Orient.

The Development of China

The Baron in the interview devoted no small amount of attention to the work Japan is now carrying out in developing China. He pointed out that the northern part of China had tremendous resources in iron and coal, and did not try to conceal his opinion that Japan was in the best position of any country to bring them into use for China and the rest of the world. He emphasized again and again, however, Japan's keen desire for American co-operation in China and the Far East. It has been noted above that he had strong opinions that Japan could not properly be called aggressive in its dealings with China, and he pointed out a number of things that would tend to show the opposite. For one thing, he said, Japan was about to give up its privilege of extra-territoriality in China whereby foreigners have the right to be tried in their own courts and under their own laws. Japan is the first nation to take this step, and it will also essay to bring about a codification of Chinese laws and regulations, so that by means of China's having a more efficient legal system, extra-territoriality will not be necessary.

The world has always been impressed by the manner in which the United States returned the Boxer indemnity in the form of a fund to encourage the education of China's youths. Japan, said Baron Goto, is now considering taking the same step and hopes to work out the same plan in the near future. Japan in assisting to develop China has invested in the railways of the latter country some $25,000,000 during the last three or four years. This money, the Baron emphasized, however, has not been loaned in a general way, but covers particular railway projects. These have been mentioned in detail in the *Railway Age* from time to time, and it is only necessary to point out that the lines in question are extensions of present systems meant primarily to reach the iron and coal resources of northern China.

Japan already has a large mileage of railways in Manchuria and by the war came into possession of the Shantung Railway, formerly owned by the Germans. These lines are absolutely controlled by the Japanese. The new lines, for which the loans have been made, the Baron emphasized, are quite different. They are to be operated not by the Japanese, but to be under the control of the Chinese Ministry of Communications, which will operate them with the assistance of Japanese advisers and supervisors. One most important factor is that there is no requirement that supplies must be bought in Japan. Many of the British, French and Belgian

concessions have a requirement that equipment must be bought from the country from which the loans are obtained —a provision that proved of great hardship during the war when cars and locomotives could not be bought in Europe. The lack of this provision will no doubt prove of great value to the United States, for China and Japan alike have shown a great favor for American railway supplies.

America has supplied great numbers of cars and locomotives for the railways under the control of the Chinese Ministry of Communications. Not only have American car and locomotive manufacturers supplied equipment in quantity for the South Manchurian Railways, but that system, as noted above, is largely built and equipped to American standards.

The *Railway Age* representative did not question Baron Goto in any degree concerning the railways of Japan because Mr. Kasama has already covered that factor in an interview in the *Railway Age* last year (February 22, 1918, page 409). He did ask, however, concerning the status of the project to convert Japan's roads to standard gage, an idea which was worked out and fathered by Baron Goto. The project is now being held in abeyance. Large sections of Japan's lines have their right of way and bridges made to 4 ft. 8½ in. gage standards largely through the efforts of Baron Goto and there seems to be no doubt that the change from 3 ft. 6 in. to standard will be carried out eventually. This will give Japan the same gage as its other lines in Manchuria and Chosen, which were converted to standard gage a number of years ago.

In closing his interview the Baron expressed his appreciation of America's railroads and their equipment and added that Japan in railway matters came to us as a pupil. The Japanese railways are well operated, he admitted, but they still needed a great deal to bring them up to American railroad standards physically.

Rail Production in 1918

THE PRODUCTION OF RAILS in the United States for 1918 was 2,533,675 gross tons or a reduction of 410,486 tons as compared to 1917, and 1,444,212 tons less than the record production of 1906. These statistics are given in a special bulletin issued by the American Iron and Steel Institute, New York, from which the following table giving the production of rails by processes for the years 1902 to 1918, inclusive, was taken:

PRODUCTION OF RAILS BY PROCESSES, IN GROSS TONS.

Years	Open hearth	Bessemer	Rerolled*	Electric	Iron	Total
1902	6,029	2,935,392	.....	.....	6,512	2,947,933
1903	45,054	2,946,756	.....	.....	667	2,992,477
1904	145,883	2,137,957	.....	.....	871	2,284,711
1905	183,264	3,192,347	.....	.....	318	3,375,929
1906	186,413	3,791,459	.....	.....	15	3,977,887
1907	252,704	3,380,025	.....	.....	925	3,633,654
1908	571,791	1,349,153	.....	.....	71	1,921.015
1909	1,256,674	1,767,171	.....	†	.....	3,023,845
1910	1,751,359	1,884,442	.....	†	230	3,636.031
1911	1,676,923	1,053,420	91,751	462	234	2,822,790
1912	2,105,144	1,099,926	119,390	3,455	.....	3,327,915
1913	2,527,710	817,591	155,043	2,436	.....	3,502,780
1914	1,525,851	323,897	95,169	178	.....	1,945.095
1915	1,775,168	326,952	102,083	.....	.....	2,204,203
1916	2,269,600	440,092	144,826	.....	.....	2,854,518
1917	2,292,197	533,325	118,639	.....	.....	2,944,161
1918	1,938,226	494,193	101,256	.....	.....	2,533,675

* Rerolled from old steel rails. Included with Bessemer and open-hearth steel rails from 1902 to 1910 inclusive.

† Small tonnages rolled in 1909 and 1910 but included with Bessemer and open-hearth rails for these years.

These production figures include rails rolled for export, which tonnage was unusually high last year, owing to the quantities shipped to our forces and those of our allies overseas. Another evidence of the abnormal conditions during the last year is to be seen in the further increase in the relative production of Bessemer rails, the proportion being 19.5 per cent in 1918 as compared to 18.11 per cent in 1917, 15.42 in 1916 and 14.82 in 1915.

In spite of the unusual relation of the demand to the supply of rails last year, it is to be noticed that the tonnage of rails rerolled has decreased progressively in the last three years. This tonnage aggregated only 101,256 tons in 1918 as compared to 118,639 tons in 1917, and 144,826 tons in 1916. The production of renewed and rerolled rails in 1911 to 1918, inclusive, is given in detail in the following table:

PRODUCTION OF RENEWED AND REROLLED RAILS, 1911-1918

Years	Rerolled from new seconds, new defective rails, etc. Open-hearth	Bessemer	Total	Rolled from old rails	Total rerolled
1911	2,631	19,379	22,010	91,751	113,761
1912	13,140	29,446	42,586	119,390	161,976
1913	13,052	30,741	43,793	155,043	198,836
1914	13,538	13,234	26,772	95,169	121,941
1915	6,477	2,652	9,129	102,083	111,212
1916	1,711	2,149	3,860	144,826	148,686
1917	1,825	7,182	9,007	118,639	127,646
1918	13,296	19,462	32,758	101,256	134,014

Another indication of the deficiency of rail production and purchasing during the past year is given by the table below showing the production of rails by weights per yard in the years 1902 to 1918, inclusive. This goes to show that the production of rails in sections weighing 100 lb. or over has decreased far more than most of the other classes of weights, indicating that the limited tonnage of steel available for rails made it necessary to dispense with the heavier sections in considerable measure.

PRODUCTION OF RAILS BY WEIGHT PER YARD, 1902-1918

Years	Under 45 pounds	45 and less than 85	85 and less than 100	100 pounds and over	Total. Gross tons
1902	261,887	2,040,884	645,162		2,947,933
1903	221,262	1,603,088	1,168,127		2,992,477
1904	291,883	1,320,677	672,151		2,284,711
1905	228,252	1,601,624	1,546,053		3,375,929
1906	284,612	1,749.650	1,943,625		3,977,887
1907	295,838	1,569,985	1,767,831		3,633,654
1908	183,869	687,632	1,049,514		1,921,015
1909	255.726	1,024,856	1,743,263		3,023,845
1910	260,709	1,275,339	2,099,983		3,636,031
1911	218,758	1,067,696	1,536,336		2,822,790
1912	248,672	1,118,592	1,960,651		3,327,915
1913	*270,405	†967,313	2,265,062		3,502,780
1914	*238,423	†309,865	868,104	528,703	1,945,095
1915	*254,101	†518,291	742,816	688,995	2,204,203
1916	*295,535	†566,791	1,225,341	766,851	2,854,518
1917	*308,258	†882,673	989,704	763,526	2,944,161
1918	*387,907	†665,165	888,141	592,462	2,533,675

* Includes rails under 50 pounds.

† Includes 50 pounds and less than 85 pounds.

U. S. Official Photo. From U. & U., N. Y.

Loading American Wounded in France for Carriage to Debarkation Points

Railway Mounted Artillery in the War*

Use of Mobile Guns Had Reached High Stage of Development When Armistice Was Signed

As soon as war was declared against Germany the American Ordnance Department, in its search for an immediate equipment of strong artillery, surveyed the ordnance supplies of the country and discovered some 464 heavy guns which might be spared from the seacoast defenses, obtained from the Navy, or commandeered at private ordnance plants where they were being manufactured for foreign governments. There were six guns of this last-named class—powerful 12-in. weapons which had been produced for the Chilean government. It was seen that if all, or if a large part, of these guns could be made available for service in France, America would quickly provide for herself a heavy artillery equipment of formidable proportions.

The Ordnance Department conceived that the only way to make these guns available for use abroad would be to mount them on railway cars. These guns were not vital in the defense of our coast under the conditions of the war with Germany, but it was evident that they would make a valuable type of long-range artillery when placed on satisfactory railway mounts.

The guns thus available for mounting on railway cars ranged in size from the 7-in. guns of the Navy to the single enormous 16-in. howitzer which had been built experimentally by the American Ordnance Department prior to 1917. In addition there was the 16-in. howitzer, 20 calibers in length, which had been built by the Ordnance Department before 1917. The expression 14-in. guns, 50 calibers, means that the gun has a barrel diameter of 14 in. and that the gun body is 50 times the caliber of 14 in., or 700 inches (58 ft. 4 in.) long.

Origin of Railway Artillery

Mounting heavy artillery on railway cars, however, was not an idea born of the recent war. The idea was probably originally American. The Union forces at the siege of Richmond in 1863 mounted a 13-in. cast-iron mortar on a reinforced flat car, this being the first authenticated record of the use of heavy railway artillery.

In 1913 the commanding officer of the defenses of the Potomac, which comprise Forts Washington and Hunt, was called upon to report on the condition of these defenses. In reply, he advised that no further expenditure be made on any one of the fixed defenses, but recommended that a "strategic railroad" be built along the backbone of the peninsula from Point Lookout to Washington, with spurs leading to predetermined positions both on Chesapeake bay and the Potomac river, so placed as to command approaches to Washington and Baltimore.

Further, he recommended that 4 major-caliber guns, 16 medium-caliber guns, and 24 mine-defense guns be mounted on railroad platforms, with ammunition, range finding, and repair cars making up complete units, so that this armament could be quickly transported at any time to the place where most needed. He suggested that this scheme be made applicable to any portion of the coast line of the United States. His argument was based upon the fact that guns in fixed positions, of whatever caliber or place, violate the cardinal military principle of mobility.

The nations engaged in the war now ending developed to a high stage the use of heavy artillery mounted on railway cars, bringing about a combination of the necessary rigidity with great mobility considering the weight of this material.

Railway artillery came to be as varied in its design as field artillery. Each type of railway mount had certain tactical uses, and it was not considered desirable to use the different types interchangeably. The three types of cannon used on railway mounts were mortars, howitzers and guns. It was not practicable to use the same type of railway mounts for the different kinds of cannon. Moreover, these mounts differed radically from the mounts for such weapons at the seacoast defenses.

The three general types of railway mounts adopted were those which gave the gun all-around fire (360-degree traverse), those which provided limited traverse for the gun, and those which allowed no lateral movement for the gun on the carriage but were used on curved track, or epis, to give the weapons traverse aim.

The smaller weapons, such as the 7-in. and the 8-in. guns and the 12-in. mortars, were placed on mounts affording 360-degree traverse. The limited traverse mounts were used for the moderately long-range guns and howitzers. The fixed type of mount was used for long-range guns only, and included the sliding railway mounts, such as the American 12-in. and 14-in. sliding mounts and the French Schneider á glissement mounts.

The work of providing railway artillery—that is, taking the big, fixed-position guns already in existence within the United States and similar guns being produced and designing and manufacturing suitable mounts for them on railway cars—grew into such an important undertaking that it enlisted the exclusive attention of a large section within the Ordnance Department. This organization eventually found itself engaged in 10 major construction projects, which, in time, had the war continued, would have delivered more than 300 of these monster weapons to the field in France and, to a lesser extent, to the railway coast defenses of the United States.

As it was, so much of the construction—the machining of parts, and so on—was complete at the date of the armistice, that it was decided to go ahead just the same with all of the projects except three, these involving the mounting of 16 guns of 14-in. size, 50 calibers long, the production of 25 long-range, 8-in. guns, 50 calibers, and their mounting on railway cars, and the mounting of 18 coast defense, 10-in. guns, 34 calibers long, on the French Batignolles type of railway mount.

The barbette carriage revolves about a central pintle, or axis, and turns the gun around with it. When it was decided to put coast defense guns on railway cars, the guns were taken from their emplacements, barbette carriages manufactured for them, and the whole mounted upon special cars. The barbette mount revolves on a support of rollers traveling upon a circular base ring. In the railway mount the base ring is attached to the dropped central portion of the railway car. The barbette railway mount is provided with struts and plates by which the car is braced against the ground.

The Schneider railway mount is named after the French ordnance concern Schneider et Cie, which designed it. In this mount the gun and its carriage are fastened rigidly parallel to the long axis of the railway car. Thus the gun itself, independently of any movement of the car, can be

*From an advance proof of a report on "American Munitions," by Benedict Crowell, Assistant Secretary of War.

Note: Previous articles briefly describing and illustrating some of the railway mounted artillery have been published in the *Railway Age* of November 29, 1918, page 967, and December 20, 1918, page 1113.

pointed only up and down in a vertical plane, having no traverse or swing from left to right and vice versa. In order to give the weapon traverse for its aim, special railway curved tracks, called epis, are prepared at the position where it is to be fired. The car is then run along the curve until its traverse aim is correct, and the vertical aim is achieved by the movement of the gun itself. In the Schneider mount there is no recoil mechanism, but the recoil is absorbed by the retrograde movement of the car itself along the rails after the gun is fired. This movement, of course, puts the gun out of aim, and the entire unit must then be pushed by hand power back to the proper point.

In the Batignolles type, gun and cradle are mounted on a so-called top carriage that permits of small changes in horizontal pointing right and left. Thus with the railway artillery of the Batignolles type also track curves, or epis, are necessary for the accurate aiming. The Batignolles mount partially cushions the recoil by the movement of the gun itself in the cradle. But, in addition, a special track is provided at the firing point, and the entire gun car is run on this track and bolted to it with spades driven into the ground to resist what recoil is not taken up in the cradle. The unit is thus stationary in action, and the gun can be more readily returned to aim than can a gun on a Schneider mount.

The conditions under which the war with Germany was fought virtually precluded any chance of a naval attack on our shores which would engage our fixed coast defenses. The British grand fleet, with the assistance of fleets of the other allies and America, had the German battle fleet securely bottled. On the other hand, there was the prowling submarine able at all times to go to sea and even to cross the ocean, and some of the latest of these submarines were armed with long-range medium-caliber guns. It was not beyond possibility that some sort of an attack would be made on our shores by submarines of this character, yet it was safe to believe that these craft would keep wel lout of range of the guns at our stationary coast defenses.

To protect our coast from such attack the Ordnance Department conceived the plan of mounting heavy guns on railway cars. They might then be moved quickly to places on the seacoast needing defense. For this purpose the Navy turned 12 of its 7-in. rifles over to the Ordnance Department for mounting. Meanwhile our ordnance officers had designed certain standard railway artillery cars, known as models 1918, 1918 Mark I, and 1918 Mark II, for 7-in. and 8-in. guns and 12-in. mortars, respectively. These cars all had the same general features.

The model 1918 car was selected for the converted 7-in. Navy rifle. The rifle was mounted on a pedestal set on the gun car in such a manner as to give all-around fire, or 360-degree traverse. The pedestal mount permitted the gun to be depressed at an angle suitable for firing from high places along the coast down upon the low-lying submarines.

Manufacture

Contracts for the various parts for these cars and the pedestal gun mounts were let to concerns engaged in heavy steel manufacture, but the assembling was done by the American Car & Foundry Company at Berwick, Pa. Twelve of the 7-in. rifles were so mounted. As this equipment was intended exclusively for use in this country, the gun cars were equipped with the American type of car couplings.

For the 8-in. guns taken from seacoast fortifications the Ordnance Department designed a barbette mount giving complete, 360-degree, traverse, thus providing for fire in any direction. There were 96 such guns available for railway mounts. Orders for 47 gun cars with carriages for mounting the weapons were placed with three concerns—the Morgan Engineering Company of Alliance, Ohio, the Harrisburg Manufacturing & Boiler Company of Harrisburg, Pa., and the American Car & Foundry Company of Berwick. Two of the three contractors found it necessary to provide additional facilities and machine-tool equipment at their plants in order to handle this job.

The first railway mount for the 8-in. gun was completed and sent to the Aberdeen proving ground for test in May, 1918. In early June the test had shown that the weapon was efficient and entirely satisfactory. Before the end of the year 1918 a total of 24 complete units, with ammunition cars for standard-gage track, shell cars for narrow-gage track, transportation cars, tools, spare parts, and all the other necessary appurtenances of a unit of this character, had been completed. Three complete 8-in. units were shipped overseas before the armistice was signed.

When the armistice came the Harrisburg company had delivered 9 of these mounts and the Morgan Engineering Company an equal number, making 18 in all. The former concern had reached an output of 5 mounts per month and the latter 10 per month.

An interesting feature of this mount is that it can be used either on standard-gage or on narrow-gage railroad track. The narrow-gage adopted was that in standard use in the fighting zones in France, the distance between the rails being 60 centimeters, or the approximate equivalent of 24 inches. Each gun car was provided with interchangeable trucks to fit either gage. The artillery train necessary for the maneuvering of the weapon was also similarly equipped to travel on either sort of track.

As a rule, the longer the barrel of a cannon, the greater its range. The 8-in. seacoast guns thus mounted were 35 calibers in length; that is, 35 times 8 in., or 23 ft. 4 in. The requirements of our forces in the field in France called for guns of this same size but of longer range. Consequently an 8-in. gun of 50 calibers—that is, 10 ft. longer than the seacoast 8-in. gun—was designed, and 25 of them were ordered. This project came as a later development in the war, the guns being intended for use abroad in 1920. The railway mounts for the weapons had not been placed in production when the armistice came. Because of the incomplete status of this project in the autumn of 1918, the whole undertaking was abandoned.

There were at the seacoast defenses and in the stores of the Army a large number of 10-in. guns of 34 calibers. Of these 129 were available for mounting on railway cars. It was proposed to mount these weapons on two types of French railway mounts—the Schneider and the Batignolles.

The project to mount 36 of these weapons on Schneider mounts was taken up as a joint operation of the United States and French governments, the heavy forging and rough machining to be done in this country and the finishing and assembling in the French shops. The American contractors were three. The Harrisburg Manufacturing & Boiler Company undertook to furnish the major portion of the fabricated materials for the carriages and cars. The Pullman Company contracted to produce the necessary trucks for the gun cars, while the American Car & Foundry Company engaged to build the ammunition cars.

Eight sets of fabricated parts to be assembled in France had been produced before the armistice was signed. General Pershing had requested the delivery in France of the 36 sets of parts by March 2, 1919. After the armistice was signed there was a natural let-down in speed in nearly all ordnance factories, but even without the spur of military necessity the contracting concerns were able by April 7, 1919, to deliver 22 of the 36 sets ordered. Had the war continued through the winter there is little question but that all 36 sets of parts would have been in France on the date specified.

The 10-in. seacoast gun, Batignolles mount project, was placed exclusively in the hands of the Marion Steam Shovel

Company of Marion, Ohio. It had been proposed also to mount 12-in. seacoast guns on this same type of equipment, and this work, too, went to the Marion concern. There were to be produced 18 of the 10-in. units and 12 of the larger ones.

The Marion Steam Shovel Company had had a large experience in producing heavy construction and road-building equipment. The concern encountered numerous difficulties at the start in translating the French drawings and in substituting the American standard materials for those specified by the French. These difficulties, combined with struggles to obtain raw materials and the equipment for the increased facilities which had to be provided at the factory, so delayed production that no mount for either the 10-in. or 12-in. guns had been delivered at the time of the armistice. The first mount of these classes—one with a 12-in. gun—reached the Aberdeen proving ground about April 1, 1919. The 10-in. project, calling for 18 mounts, was cancelled soon after November 11, 1918. The work on the dozen mounts for 12-in. guns, however, had progressed so far that the Ordnance Department ordered the completion of the entire equipment.

As has been stated, the government found in this country six 12-in. guns being made for the Republic of Chile. Their length of 50 calibers gave them a specially long range. It was decided to place the Chilean guns on a sliding mount. In a mount of this type the retrograde movement of the car along the track as and after the gun is fired takes up and absorbs the energy of fire.

Types

The first sliding railway mount used on the Allied side in the great war was of French design. But our manufacturers had so much trouble with French designs that when the project came up of mounting the Chilean guns in this fashion it was decided that it would be quicker to design our own mount. Consequently the French design was taken in hand by our ordnance engineers and re-designed to conform to American practice, with the inclusion in the design of all original ideas developed by the Ordnance Department in its creative work during the war period up to that time. The manufacturers who looked at the French design of the sliding railway mount estimated that it would take from 12 to 18 months before the unit could be duplicated in this country and first deliveries made. They looked at the American design and estimated that they could build it in 3 months.

It was decided to build three mounts of this character and thus have a reserve of one gun for each mount to reserve as replacement when the original guns were worn out. Contracts were placed in the early summer of 1918, and all three mounts were delivered before the armistice was signed, the first mount being completed within 85 days after the order was placed. For these mounts the American Bridge Company furnished the main girders or side pieces, the Baldwin Locomotive Company built the railway trucks and the Morgan Engineering Company manufactured the many other parts and assembled the complete units. The speed in manufacture was made possible by the fact that the plant engineers of the three companies helped the ordnance officers in designing the details. With such intimate co-operation, the concerns were able to begin the manufacture of component parts while the drawings were being made.

All three weapons with their entire equipment, including supplies, spare parts, ammunition cars, and the whole trains that make up such units, were ready for shipment to France in November, 1918. Each mount as it stands today is 105 ft. long and weighs 600,000 pounds. The load of the gun and the peak load put on the carriage when the gun is fired are so great that it requires four trucks of 8 wheels each, 32 car wheels in all, to distribute the load safely over ordinary standard-gage track.

In years past the Ordnance Department had procured a large number of 12-in. mortars for use at seacoast defenses. These great weapons are 10 calibers in length, or 10 ft. in linear measurement, the diameter of the barrel being just an even foot. Of the number stationed at the coastal forts and in reserve it was decided that 150 could be safely withdrawn and prepared for use against Germany. When General Pershing was informed of the proposal, he asked that 40 of these weapons mounted on railway cars should be delivered to the American Expeditionary Forces for use in the planned campaign of 1919. In order that there might be an adequate supply of them, the Ordnance Department let contracts for the mounting of 91 of these mortars on railway equipment, a project which would give the United States a formidable armament and still provide a reserve of 59 mortars to replace the service mortars on the carriages after repeated firing had worn them out.

This job proved to be one of the largest in the whole artillery program. The entire contract was let to the Morgan Engineering Company of Alliance, Ohio. In order to handle the contract a special ordnance plant, costing $1,700,000 for the building alone, had to be constructed at the company's works at Alliance. The work was so highly specialized that machine tools designed for the particular purpose had to be produced. The government itself bought these tools at a cost of $1,800,000. Although work on this plant was not started until December 10, 1917, and although thereafter followed weeks and weeks of the severest winter weather known in recent years, with all the delays in the deliveries of materials which such weather conditions bring about, the plant was entirely complete on June 1, 1918, not only, but the work of producing the mounts had started in it long before that, some machines getting to work as early as April.

The gun car used for mounting the mortar carriage was of the same design as that for the 7-in. and 8-in. guns, except that each truck had six wheels. The carriage built upon this car was of the barbette type, and it allowed the gun to be pointed upward to an angle as high as 65 degrees and provided complete traverse, so that the mortar could be fired in any direction from the car. A hydropneumatic system for absorbing the recoil of the mortar after firing was adopted. This recuperator in itself was a difficult problem for the manufacturer to solve, being the first hydropneumatic recuperator of the size ever built in this country.

In spite of the weight and elaborate character of this unit it was put into production in an astonishingly short space of time. The pilot mount came through on August 22, 1918, less than nine months after the spade was first struck in the ground to begin the erection of the ordnance plant. By the end of August the pilot mortar had successfully passed its firing tests at Aberdeen, functioning properly at angles of elevation from 22 degrees to 65 degrees and in any direction from the mount. While this unit was put through hurriedly for these tests, the preparation for the rest of the deliveries was made on a grand scale, looking toward quantity production later on. When the armistice was signed, every casting, forging and structural part for every one of the 91 railway mounts was on hand and completed at the works of the Morgan Engineering Company, and thereafter the process was merely one of assembling, although in a unit of such size the assembling job alone was one of great magnitude. Even at the reduced rate of production incident to the relaxation of tension after the armistice was signed, the company delivered 45 complete units to the government up to April 7, 1919, or five more than General Pershing said he would require during the whole campaign of 1919. Careful estimates show that if the war had con-

tinued the company would have delivered the mounts at the rate of 15 per month beginning on December 15, 1918, a rate which would have completed the entire project for 91 mounts by the middle of June, 1919.

As in the case of the 8-in. railway guns, the 12-in. mortars were provided with interchangeable wheel trucks allowing the unit to travel and work either on standard gage track or on the 60-centimeter, narrow-gage track of the war zone in France.

The War Department did not have any 14-in. guns which could be spared from the seacoast defenses for use abroad. The Ordnance Department, therefore, inaugurated the project for the construction of 60 guns of 14-in. caliber. For the construction of such guns complete new plants were required, as all available facilities were already taken over for other projects considered more important. This contract was to have been turned out by the Neville Island ordnance plant. The Navy Department in May, 1918, expressed willingness to turn over to the Army certain 14-in. guns, 50 calibers, then under construction and of which it was estimated that 30 would be completed by March, 1919.

It was decided to place some of these 14-in. guns on American sliding railway mounts, and 16 such mounts were ordered from the Baldwin Locomotive Works, deliveries to begin February 1, 1919. The 16 units were to be delivered prior to April, 1919, but due to the signing of the armistice work was suspended on the contracts, since the mounts were designed for use in France. The contract was cancelled in March, 1919.

The Navy itself placed five of these guns on railway mounts of another design to be operated in France by naval forces on shore. Eleven such mounts were built by the Baldwin Locomotive Works under the supervision of the Navy Ordnance Bureau, and six of them were afterwards turned over to the Army.

Without discussing here the 12-in. howitzers, 20 ft. long, which the Ordnance Department ordered produced and mounted on a railway truck, a development for use abroad in 1920, we come, finally to the largest weapon of all in the railway artillery program, the 16-in. howitzer, the barrel of this mighty weapon being 26 ft. 6 in. long. The American 16-in. howitzer had been forged out and finished prior to the date of America's entrance into the war. It was proposed to place this weapon on a railway mount and make it available for use on the western front.

The Ordnance Department completed the design for the mount on February 10, 1918. In order to turn out the unit in the shortest possible time, the project was placed with three manufacturers, each of whom was to produce different parts. The American Bridge Company received the order to build the structural parts, the Baldwin Locomotive Works contracted for the trucks, while the Morgan Engineering Company undertook to assemble the unit and also to build the top carriage and other mechanical parts. The contractors did a speedy job in producing the mount for this howitzer.

In nearly all railway artillery of this size it is necessary to provide bracing when the gun is set up in position for firing. The 16-in. howitzer mount was unique in that the weapon could be fired from the trucks without any track preparation whatsoever. An exhaustive test at the Aberdeen proving grounds demonstrated that this piece of artillery ranked with the highest types of ordnance in use by any country in the world.

In the meantime orders had been placed for 61 additional howitzers. The American Expeditionary Forces asked that 12 of these enormous weapons be sent overseas as soon as they could be produced, a job which naturally would have extended over a period of months, if not years. Since none of the additional howitzers had been produced when the armistice was signed, the project of building mounts for them never got under way. The pilot howitzer and mount were not shipped abroad.

Operation

In the design of railway equipment for high-angle weapons such as howitzers, two loads must be considered by the builders in order to provide a gun car of sufficient strength to hold its freight. One of these loads, the lighter one, consists merely of the ordinary weight of the gun and its carriage upon the car wheels. The other load, the so-called firing load, consists of the weight of the unit plus the additional weight of the downthrust of the howitzer when it recoils. In the case of the 16-in. howitzer the firing load is approximately 748,231 pounds. The weight of 748,231 pounds must be distributed along the tracks by the numerous sets of wheels at the instant the gun is fired.

The mount for the howitzer is so constructed that this load is partly taken up by the slide of the gun car along the track. In addition, the howitzer is equipped with a hydraulic recoil cylinder. Thus the unit has a double recoil system. The car trucks in the tests comfortably transmitted, through a series of equalizer springs, this enormous load upon an ordinary rock-ballast track, without any distortion to the track or roadbed or impairment to the working parts of the unit. After each discharge the whole huge mount moves backward along the track for a distance of 20 or 30 feet.

Each railway artillery project called for the manufacture of a great equipment of ammunition cars, fire-control cars, spare-parts cars, supply cars, and the like, a complete unit being a heavy train in itself. Such armament-train cars, together with numerous other accessories and necessary equipment, were designed by the Ordnance Department and produced for each mount. In all, 530 ammunition cars were produced up to April, 1919. Most of them were

RAILWAY ARTILLERY PROJECT

Type	Total ordered	Number produced November 11, 1918	Number produced to April 7, 1919	Number required by A.E.F. for campaign during 1919	Guns available	Remarks
7-inch Navy gun, railway mount.	12	12	12	0	12	Produced for antisubmarine work along America's seacoast.
8-inch 35-caliber seacoast gun, railway mount.	47	18	33	36	96	
10-inch, 34-caliber seacoast gun on French type railway mount.	36	[1]8	[1]22	36	111	Fabricated material and trucks, complete, produced within country, mount to be assembled in France.
Do.....	18	0	..	0	18	Project canceled on signing of the armistice, Batignolles.
12-inch, 35-caliber seacoast gun on French type railway mount.	12	0	1	12	49	French Batignolles type.
12-inch, 50-caliber gun on American sliding railway mount.	3	3	3	4	6	Guns obtained from Chilean Government manufactured in this country.
14-inch, 50-caliber naval gun on railway mount.	11	11	11	11	21	
12-inch, 10-caliber seacoast mortar on railway mount.	91	1	45	40	150	
16-inch howitzer, 20-caliber, on railway mount.	1	1	1	0	1	61 guns under construction.
14-inch, 50-caliber guns on American sliding railway mount.	16	0	..	..	..	Project canceled March 11, 1919. Guns under construction.
12-inch, 20-caliber howitzer on railway mount.	1	0	..	..	..	If war had continued, 60 mounts contemplated.

[1]Sets fabricated parts.

shipped abroad, but 118 were retained for use in this country.

Since the overseas cars were to be used with French railway equipment, it was necessary to fit them out with French standard screw couplers, air brakes and other appliances for connecting up with French railway cars.

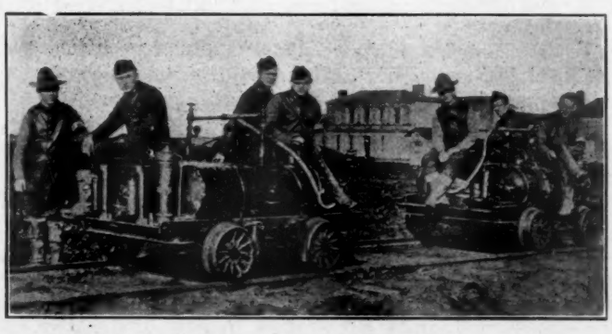
The matter of traction power for these gun and armament trains near the front set a problem for the Ordnance Department to solve. It was out of the question to use steam engines near the enemy's lines, since the steam and smoke would betray the location of artillery trains at great distances. The Ordnance Department adopted a gas-electric locomotive of 400 horsepower to be used to pull railway artillery trains at the front, and was on the point of letting a contract to the General Electric Company for the manufacture of 50 of them when the armistice was signed, making further equipment unnecessary.

The Neville Island ordnance plant, on an island in the Ohio River near Pittsburgh, would have produced weapons of the character of those used with railway mounts and would have turned them out in large numbers had the armistice not come to put an end to this enormous arsenal project. The plant was being erected for the government by the United States Steel Corporation without profit to itself. The estimated cost of this plant when finished was $150,000,000. Designed to supply the needs of the Army for artillery of the heaviest types, the Neville Island plant was being constructed on such a scale that it would surpass in size and capacity any of the famous gun works of Europe, including the Krupps.

It was being equipped to handle huge ordnance undertakings, such as the monthly completion of 15 great 14-in. guns and the production of 40,000 projectiles monthly for 14-in. and 16-in. guns. The plans of the government contemplated the production of 14-in. guns to the number of 165 in all and their shipment to France in time to be in the field before May 1, 1920. An initial order for 90 of these weapons had been placed at the arsenal while it was being erected.

Besides 14-in. guns the plant was being equipped to turn out 16-in. and even 18-in. weapons. The immense size of the machinery necessary for such production can be understood when it is noted than an 18-in. gun weighs 510,000 pounds and a 14-in. gun 180,000 pounds. It requires from 12 to 18 months to produce guns of this size, yet Neville Island was being developed on a scale to build hundreds of them simultaneously. The entire plant was to cover 573 acres and was to employ 20,000 workmen when in full operation.

At the signing of the armistice work was suspended at Neville Island, and four months later the whole project was abandoned.



U. S. Official Photo. From U. & U., N. Y.

Fire Fighters with Speeders at St. Sulpice, Gironde, France

Objections to Proposed Rules for Competitive Bids Under Clayton Law

A SPECIAL COMMITTEE appointed by the American Railway Association in 1916 has filed with the Interstate Commerce Commission a series of objections and suggestions for changes in the proposed regulations issued by the commission on April 10 to govern the method of securing competitive bids as required by Section 10 of the Clayton anti-trust law in connection with dealings in securities or purchases or contracts between companies having an interlocking interest.

The attention of the commission is called to the fact that on June 20, 1916, a hearing was had before the commission in respect to the matter of rules proposed at that time, at which the carriers, after making their objections to the rules tentatively proposed by the commission, requested the commission to appoint a committee to act on its behalf in conference with a committee representing the carriers for the purpose of reporting rules and regulations recommended for adoption.

The commission appointed such a committee and the American Railway Association also appointed a committee, including Julius Kruttschnitt, W. W. Atterbury, W. G. Belser and Alfred P. Thom, W. A. Worthington representing Mr. Kruttschnitt and S. Porcher representing Mr. Atterbury. The two committees held conferences but no final report was announced because Congress suspended the operation of the law. The railroad committee now urges that as the matter is being taken up anew, a similar conference between representatives of the carriers and such representatives of the commission as it may appoint, may be permitted.

The statement filed for the committee by Mr. Thom as its counsel says the question is how far it is safe in the public interest to put the carriers in "the straight jacket of unyielding rules" in respect to their purchases, and while the policy of the law must, of course, be carried out, much will depend upon the character of the regulations which are adopted because it is of the utmost importance that while protecting the interests of the public these regulations be made sufficiently elastic to adapt themselves properly to the economic conditions which surround purchases and to the needs of the carriers. It is, therefore, urged upon the commission that the matter of the formulation of these rules be taken up now where it was left off when the law was suspended and that conferences shall be resumed. In the event that the commission does not see its way clear to do this without further consideration the committee asks for an opportunity of presenting orally to the commission its views on the subject. A copy of the suggestions made by the carriers to the conference committee is attached and the commission is asked to give careful consideration to the suggestions then made. The tentative regulations proposed by the commission, to which any objections were to be filed by May 15, were published in the *Railway Age* of April 18, page 1009.

Pending a determination of the request above made, the committee makes a preliminary return to the order of the commission of April 7, in part as follows:

It is most important that doubts which will arise as to the meaning of the law and as to its scope and application, shall be cleared up by conference rulings and we, therefore, respectfully urge that the commission make such conference rulings and adopt the rules set forth in Exhibit A hereto attached.

1. Section 10 of the Clayton act should not be construed to apply to dealings between a corporation and its subsidiaries. The reasons for this were given in detail by carriers' counsel in proceedings before the commission on June 20, 1916. It is manifest that a ruling of this kind is neces-

sary to preserve the integrity of the carriers' organizations and that such a ruling is in the public interest.

2. Section 10 should not apply to dealings in respect to which there can be no competition, such as patented articles, purchases of water, gas, electricity, maintenance of company standards, etc.

3. The commission should make some definition of the expression "substantial interest," as, if that is left to individual judgment, there can be no uniform interpretation of this expression and no way of knowing when, in this respect, the act becomes applicable.

4. The commission should define the expression "most favorable bid" in such a way that carriers may be permitted to exercise an honest business discretion as to what bid in all the circumstances of the case is most favorable to its interest.

In the rules now proposed by the commission two tests alone are permitted in respect to what constitutes the most favorable bid:

(1) That the bid must be the lowest price for material purchased and the highest price for securities sold.

(2) The ability and reliability of the bidder financially and otherwise.

We submit that this is too narrow a definition. The definition as now proposed does not give sufficient latitude in respect to the reliance any particular carrier may have on dealers in regard to the special materials they furnish, the character of the article which is to be delivered, or with respect to the bearing that this particular transaction may have on other transactions with the same party, nor to the broader and perfectly honest business considerations which frequently affect the judgment of men in business as to what is the most favorable transaction. It likewise takes no note of the necessity which a carrier is frequently under to apportion its purchases among several for the purpose of keeping labor employed along its lines and available quickly for pressing needs in the manufacture or production of articles. As submitted in the brief, an honest business discretion seems to be the only proper criterion of what should be applied in determining what is the most favorable bid.

For example, it is most important for a railroad at times to keep certain coal mines on its road open for fuel purposes. This is also in the public interest. It is also frequently necessary for them to keep certain tie concerns on its road in operation. This applies also in the matter of equipment where it is necessary to have the manufacture of equipment continued at separated points, and where it is necessary to make an apportionment in order to get early deliveries. Many of these very desirable things would be prevented if the rule is restricted within the narrow limits as now proposed.

It will be observed that the latitude respecting delivery contained in the proposed rules doubtless is confined to deliveries contemplated when the advertisement is made, whereas conditions may change, and an honest business discretion would require the railroad to accept some bid, not quite the lowest, because it afterwards transpired that very much more favorable deliveries can be obtained.

5. The act should be construed so as to cover only dealings and transactions which take place subsequent to the effective date of Section 10; that is to say, it should not apply to dealings previous to 1919, although delivery under such dealings may be made during 1919.

6. In ascertaining whether or not dealings amount in the aggregate to more than $50,000 in any one year, the measure should be the time when the dealings are had and not the time of performance or of deliveries. Some conference ruling of this kind is manifestly needed to avoid difference in understanding.

7. It should be made clear that the expression "dealings in securities" does not apply to the borrowing of money for a period of not exceeding one year nor to the renewal thereof for like periods, nor to the pledge, as security for money borrowed, of securities. This is very important.

8. It would also be well to make clear that the act begins to operate only with the transaction which brings the sum above $50,000.

Remarks as to Regulations Presented by Commission for Consideration May 15

The proposed rules represent a considerable improvement over those originally suggested and with the foregoing conference rulings would represent a better working plan. The new regulations are, however, objectionable in certain respects, notably in the following:

Referring to page 3, line 4, of the regulations, publication is required in at least two newspapers, one at operating headquarters and the other in certain cities. It may be in some cases that the operating headquarters will also be at one of the cities especially designated. In such case there should be necessity for publication in only one newspaper instead of two.

The provision in paragraph 3 of the regulations affording to each bidder an opportunity of examining each bid and of furnishing each bidder with a tabulation of the proposals, is a very objectionable feature and should be entirely eliminated from the regulations. This feature will tend to deter some potential competitors from bidding at all and almost certainly would cause responsible bidders to refrain from naming the lowest price which they are willing to accept, as they do not wish their competitors to know exactly what they are doing in the matter of prices. The proposal invites collective bidding, furnishes notice to the lowest or most favorable bidder that no revision of his formal bid is necessary to secure the business, and entirely prevents successful negotiation after bids are opened for a still lower price, which is very frequently obtainable. It is felt that the public interest would be safeguarded without public opening of bids so long as the Interstate Commerce Commission may require the furnishing of desired information and always has access to the carriers' records.

We also call special attention to the rule suggested by us as Item No. 6 of the memorandum. Large sums of money are annually saved to each carrier by the power to negotiate with the lowest bidder for a still lower bid. If a new advertisement is necessary in order to do this, an additional charge of unknown proportions, but great in amount, will be added to the carriers' expense and execution of work will be needlessly delayed. It does not seem to us that any harm can come to the public from making the rule read as we have suggested. On the contrary, immense advantage will come to the carriers and will thus be reflected in its beneficial influence on the public.

A method for conducting emergency purchases should be provided, otherwise considerable hardship may be imposed upon the carriers.

To allow time for thorough understanding it would be desirable if the commission's rules would become effective not earlier than July 1, 1919.

Other objections will appear by comparison of the regulations now proposed by the commission with those contained in Exhibit A.

The carriers present the above views in writing, as requested in the order of April 7, but would be glad of an opportunity to supplement them with oral testimony if the commission so desires or to co-operate, as above suggested, in revising the regulations with a special committee if the commission will grant our request to have the matter so handled.

The Railroad Administration has filed a statement with

the commission as a disclaimer, taking the position that the law does not apply to transactions of the railroads operated by the government. The short line railroads have filed no statement with the commission but intend to ask Congress to repeal the law.

National Parks and Monuments Advertising Appears

RAILROAD LITERATURE, such as the traveling public was accustomed to see before the elimination of advertising as a war measure by the Railroad Administration, has again made its appearance in the ticket offices, travel bureaus and tourist agencies. Magazines and newspapers which formerly reaped a neat revenue from advertisements inserted by railroad companies concerning points of interest reached by their lines are again carrying "See America First" displays. All this is part of the Railroad Administration's advertising campaigns, the purpose of which is to stimulate travel. Much of this advertising is substantially the same as that familiar to tourists in pre-war days, with the exception that there is no mention made of the carriers reaching these places nor is anything said of preferred routes.

This campaign, in so far as the western district is concerned—and it is this district to which a large percentage of the annual summer tourist traffic goes,—is well under way and 10 of 18 books, each dealing with some national park, national monument or resort region in the west, have been prepared and are now being distributed. These books, ranging in size from 16 to 80 pages, and dealing with a particular region, have been written more as an advertisement of the particular region than as an advertisement of the carrier which reaches that place. With vivid descriptions and profuse illustrations the beauties are enumerated of Arizona and the New Mexico Rockies, California, Colorado and the Utah Rockies, Crater Lake National Park, Oregon; Glacier National Park, Montana; Grand Canyon National Park, Arizona; Hawaii National Park, Hawaiian Islands; Hot Springs National Park, Arkansas; Mesa Verde National Park, Colorado; Mt. Rainier National Park, Washington; the Pacific Northwest and Alaska; the Petrified Forest National Monument, Arizona; Rocky Mountain National Park, Colorado; Sequoia and General Grant National Parks, California; Yellowstone National Park, Wyoming; Yosemite National Park, California; the Zion National Monument, Utah, and the Northern Lakes of the Central West.

An innovation in the composing of books of this type is the inclusion of an introduction written by a well-known writer whose familiarity with the section advertised is nationally known. Enumerating the writers who are interested in this work sounds much like an American literary Hall of Fame—Mary Roberts Rinehart wrote the introduction for the book on Glacier National Park; Emerson Hough for Yellowstone National Park; Winston Churchill for Crater Lake National Park; Gilbert H. Grosvenor, editor of the National Geographic Magazine, for Mt. Rainier National Park; Enos A. Mills for Rocky Mountain National Park; Jack Lait for the Zion National Monument; Opie Read for Hot Springs National Park; Edwin Markham for California; Edwin L. Sabin for Colorado and Utah; Doctor J. Walter Fewkes, chief of the Bureau of American Ethnology, Smithsonian Institute, for Mesa Verde National Park; Charles F. Lummis for Grand Canyon National Park and the Petrified Forest National Monument; Harriet Monroe for Yosemite National Park; E. A. Newman for Hawaii National Park; Hamlin Garland for the Pacific Northwest and Alaska; Zane Grey for Arizona and New Mexico, and Albert Britt, editor of the Outing Magazine, for the Northern Lakes.

As stated before, ten of these books already have been compiled and are now being distributed. The work of preparing this advertising matter has been done by the Western Passenger Traffic Committee and under the direct supervision of W. H. Simpson, chairman of the advertising committee appointed to handle this work for the Western district. The actual work of compiling statistics and facts, selecting photos, etc., concerning the different parks and regions, was assigned to subcommittees composed of representatives of different railroads serving the particular places to be advertised. Distribution of the books has been placed in the hands of the Travel Bureau—Western Lines, Chicago, of which Howard H. Hays is manager. This bureau has made arrangements to have the books on western points shipped to passenger traffic officers for distribution to important ticket offices other than consolidated ticket offices; to passenger traffic officers, who in turn will furnish supplies to union station ticket offices and to offices interested; to consolidated ticket offices, and to tourist agencies and travel bureaus. While the work of distribution of the first copies of these books was only begun during the past week, they have already received extensive circulation.

The magazine and newspaper advertising already mentioned is still in the embryonic state, but it is planned to have this matter before the public before the annual tourist season to western resorts opens, which is usually about June 1. This work likewise has been placed in the hands of the Western Passenger Traffic Committee, and under the supervision of Mr. Simpson.

To further the "See America First" campaign, the Bureau of Service, National Parks and Monuments, has obtained a stock of lantern slides and motion picture films, featuring the national parks and monuments already mentioned. These slides and films are to be loaned for exhibition purposes without cost excepting, of course, the express charges in both directions. The lantern slides, which are accompanied by adequate lecture notes, include as subjects the following National Parks: Glacier, Grand Canyon, Mesa Verde, Mt. Rainier, Rocky Mountain, Yellowstone, Yosemite, Sequoia, and General Grant. Among the motion picture films obtained and available at this bureau are reels featuring the Crater National Park, Glacier National Park, Grand Canyon National Park, Mesa Verde National Park, Mt. Rainier National Park, Rocky Mountain National Park, Yellowstone National Park and the Yosemite National Park. Added to this collection are several reels of films featuring Alaska, the Columbia River Scenic Highway, the Dawn of Electrical Era in Railroading, Central Wyoming, Idaho, Portland Rose Festival, Royal Gorge and the California Scenes.

Although the tourist travel in the west during the summer is greatly in excess of that in the east the committee handling this advertising matter for the eastern district has issued similar books concerning the Adirondack mountains and Thousand Islands, the Blue Ridge and Allegheny mountains, the Catskill mountains and Sullivan County, New York; Long Island, New York; New England lakes and mountains, New England shores north and east of Boston, New England shores south of Boston, New Jersey seashore, Niagara Falls and the Highland of Ontario, Saratoga Springs, Lake George and Lake Champlain, summer resorts in the south, the Pocomos, Delaware Water Gap, Mauch Chunk and Chautauqua Lake. This work is being done by the Eastern Passenger Traffic Committee, under the supervision of its advertising committee, of which Mr. P. V. D. Lockwood is chairman. The newspaper and magazine advertising campaign is similar to that of the western lines.

The Southern Passenger Traffic Committee has issued one booklet for summer resorts of the south. Its advertising will be confined to newspapers.

Present plans of the committees both in the east, west and south, provide for the continuing of this form of advertising throughout the summer and the succeeding winter.

Closing Sessions of the Air Brake Association

A REPORT of the greater part of the twenty-sixth annual convention of the Air Brake Association was given in last week's *Railway Age*, page 1165. Other papers which were presented include the following:

How Can Enginemen and Trainmen Assist in Air Brake Maintenance?

By H. A. Glick
Air Brake Inspector, Bangor and Aroostook

While locomotive engineers are not primarily responsible for air brake design and maintenance, they can, nevertheless, aid materially by making careful and specific reports about air brake conditions on their locomotives requiring attention. Many of the defects that may arise in the course of a trip, especially leakage in the numerous pipe connections that contain air pressure, due to vibration or improperly connected pipe joints, can be discovered better by the engineer while the locomotive is under steam and air pressure and in his charge. His co-operation in reporting intelligently and reliably all air brake troubles is essential to good air brake maintenance.

Whenever trouble arises with any air brake part on an engine, the man that delivers the engine should properly book on the work report the actual defect that exists, but should not book non-essential or imaginary defects; for by so doing he causes a great deal of unnecessary work on the part of the roundhouse force. The time so used is simply wasted and might be used to good advantage performing essential work on this and other engines. Before taking an engine out the engineman should know that all air brake parts perform their functions, and not take it for granted that they do; that is, he should make the necessray tests to convince himself that they are in good condition.

The trainman can assist and he should be duty bound to do so, by following the general air brake instructions now existing on all railroads, by taking greater interest in them, and consequently, in his own welfare. If he does not follow the general instructions, he should be made to do so by proper measures from his superiors, and also by the urging of his fellow workmen. He should be made to recognize the right and wrong of his part in air brake maintenance. There are times when the brake is cut out for no reason. No brake should be cut out of service unless a defect exists; then whoever cuts the brake out should specify the trouble on a proper air brake defect card and tie the card to the cross-over pipe on the car, so that when this car reaches an inspection point it can be repaired.

Trainmen should do everything possible to stop brake pipe leakage, as this leakage causes hardship on the air compressor, takes away from the engineer the ability to properly control the amount of the application, contributes to brakes sticking and prevents the maintenance of sufficient brake pipe pressure. The practice when separating cars of closing but one angle cock, allowing the brakes on cars back of the separation to apply in emergency, should be discontinued. When separating cars, both angle cocks should always be closed and hose should always be separated by hand. When opening angle cocks on the charged portion of train, they should be opened slowly to prevent brakes from applying in emergency. When switching cars they should not be allowed to strike any harder than three miles per hour. Coupling cars at a greater speed creates shocks, which in turn are absorbed by the unions in brake pipe connections, causing brake pipe leakage. The cordial co-operation of enginemen and trainmen in the matter of air brake maintenance is very necessary in order to get the best results.

Discussion

The necessity for co-operation between the trainmen and enginemen and the air brake repair men in order to promote proper maintenance, was emphasized by several speakers. One road reported good results by requiring trainmen to pass an examination on the proper handling of brakes.

The Air Brake Supervisor's Responsibilities to the Store Department

By W. H. Clegg
Air Brake Supervisor, Canadian National

The air brake supervisor's interest in this question starts with his discovery that some standard practice or regulation relative to air brake maintenance is not being adhered to, or that a locomotive or car is being held out of service awaiting the arrival of certain repair parts by reason of lack of knowledge or failure of the local officers to anticipate the requirements, and this in spite of the fact that less important stations are overstocked with the very parts that are needed to release the locomotive or car in question, or permit of adherence to standard practice covering repairs. Thus it appears that the supervisor in order to help himself must of necessity assist the stores department. The following should form the basis of the air brake supervisor's assistance to the storekeeper: (1) Providing suitable places for the care and preservation of repair parts in stock. (2) Advising as to the various repair parts and quantities required to be carried in stock at general stores. (3) Approving of sub-requisitions placed with general stores. (4) Periodical inspection of divisional stores and assistance to divisional storekeepers. (5) Preventing the accumulation of a surplus stock of repair parts that are seldom used. (6) Advising the general storekeeper where a surplus of repair parts are found so that same may be transferred to other terminals or returned to general stores.

The recommended assistance as outlined above requires but a very small portion of the supervisor's time and those who become interested in this matter can effect a very material saving to the railroad company without neglecting their other numerous duties and the often unsolicited efforts will eventually be fully appreciated.

Address of F. W. Brazier

At the Wednesday session F. W. Brazier, superintendent of rolling stock, New York Central Lines East, gave an inspiring address in which he counseled the younger members to devote their energies whole-heartedly to their work. He condemned the lax enforcement of the rules governing the maintenance of brake equipment to which he attributed in large measure the present unsatisfactory conditions. As an indication of the efforts the New York Central has made to maintain cars in good condition he cited the fact that as many as 800 men had been employed on air brake work alone and in 1917 the expenditure for freight car repairs had been over twice as much as for locomotive repairs.

Fuel Supervisors Addressed the Convention

At the Thursday session L. R. Pyle and F. P. Roesch, fuel supervisors of the Central Western and Northwestern

Regional Districts, respectively, delivered addresses in which they pointed out the way in which the air brake men could assist the Fuel Conservation Section. Mr. Pyle stated there has been a marked improvement in air brake conditions during the past few months, especially as regards brake pipe leakage. He urged the association to continue its support of the Fuel Conservation Section particularly by giving publicity to the magnitude of the waste of fuel caused by train line leaks. Mr. Roesch spoke of the necessity for reducing the cost of operation on the railroads now that normal conditions are being restored. As it appeared impossible to reduce wages or cut the cost of material more efficient service was the only means of effecting economies that was left. He urged all the employees to justify the large increases in wages by greater efficiency in their work.

Other Business

On Thursday morning a report was presented on damage to car brake equipment by thawing plants. The practice of thawing loads of coal and ore in buildings heated to a high temperature destroys the packing leathers, gaskets and air holes. The removal of the triple valves, hose and brake cylinder piston, before thawing, was recommended. No objection was raised to thawing by inserting steam pipes into the lading.

A paper was also submitted by the Northwest Air Brake Club advocating a braking ratio of 40 per cent. and an inside release valve for caboose cars; the Central Air Brake Club also presented a report advocating large radiating surface between the compressor and the main reservoir.

The secretary reported a membership of 1,050 with a registration at the convention of 650.

The following officers were elected: President, T. F. Lyons, New York Central; first vice-president, L. P. Streeter, Illinois Central; second vice-president, Mark Purcell, Northern Pacific; third vice-president, G. H. Wood, Atchison, Topeka & Santa Fe; secretary, F. M. Nellis, Westinghouse Air Brake Company; and treasurer, Otto Best, Nathan Manufacturing Company. Newly elected members to the Executive Committee are C. M. Kidd, Norfolk & Western; R. C. Burns, Pennsylvania; H. A. Clark, Soo Line; and H. A. Sandhas, Central of New Jersey.

Doings of the United States Railroad Administration

Nearly 19,000 Standard Cars Stored Because They Have Not Been Accepted by the Railroad Companies

WASHINGTON, D. C.

DIRECTOR GENERAL HINES and members of his staff left Washington Tuesday night for an inspection trip over the railroads in the Southwest. Mr. Hines expected to be at Memphis and Little Rock on May 15, at Dallas and Fort Worth on May 16, at Houston and Austin on May 17, at St. Louis on May 19, at Cincinnati and Columbus on May 20 and to return to Washington on May 21. He is to speak at St. Louis at the convention of the Order of Railway Conductors, at Cincinnati at the convention of the Brotherhood of Railway Clerks and at Columbus at the convention of the Brotherhood of Railroad Trainmen.

Nearly 19,000 Standard Cars Stored

The Railroad Administration has given out the following statement showing the number of U. S. R. A. standard freight cars stored as of April 30, 1919, because they have not been accepted by the railroad companies:

Type of cars	Number of cars
40 ton double sheath box cars	3,702
50 ton single sheath box cars	1,169
50 ton composite gondolas	6,043
55 ton steel hopper	8,057
70 ton low side gondolas	1
Total	18,972

Earnings, Expenses and Traffic for March and Three Months

The Operating Statistics Section has published complete figures covering the financial results of operation for the month of March for the large railroads in federal operation. 231,466 miles of road are included out of a total of 240,944 miles actually federally operated; comprising 96 per cent of the mileage and 98 per cent of the revenues.

Month of March	1919	1918	Increase or Decrease Amount	Per cent
Operating revenues	$371,520,077	$361,054,326	$10,465,751	2.9
Operating expenses	342,152,207	279,047,313	63,104,894	22.6
Net operating revenues	29,367,870	22,007,013	d 52,639,143	....
Taxes, rents, etc.	15,272,048	18,287,109	d 3,015,061	....
Net Federal income	14,095,822	63,719,904	d 49,624,082	....
Operating ratio	92.2	77.3	14.9	....

d represents decreases.

One-twelfth of the annual rental due the companies covered by the report amounts to $74,047,939, so that the net loss to the government for the month was $59,952,117.

It is stated that inasmuch as present rates are about 25 per cent higher than they were last year, the increase in operating revenues of only 2.9 per cent means that total traffic has fallen off approximately 18 per cent. The falling off in freight traffic alone has exceeded this figure. This has been partially counterbalanced by a small increase in passenger travel due to the demobilization of troops, but the passenger returns are not yet complete enough to give out any figures for March. The freight business shows a slight increase over last month, but this is not as large as is usual at this time of year under normal industrial conditions.

Comparison with 1918 is difficult because the increased rates were not in effect in March, 1918, and the increased wages for March, 1918, were not charged into operating expenses until subsequent months.

The expenses for March, 1918, do not include the increases in wages allowed by the director general in May, 1918, and subsequently in that year and retroactive to January 1, 1918. It is estimated that about $40,000,000 of such back pay was applicable to March, 1918. The expenses for March, 1919, include about $5,300,000 back pay applicable to prior months but do not include the increases recently granted to the enginemen and trainmen and the dining car employees which it is estimated will amount to about $6,000,000 per month.

It is stated that the freight train performance of March, 1919, does not compare favorably with last year, because of the severe loss in the volume of traffic, which made it difficult to maintain the trainload and carload to the higher averages which were possible while the abnormal conditions due to the war created a large volume of additional traffic, much of which was of a nature which tended to increase both the carload and the trainload. The heavy loss this year in coal traffic adversely affected both the average trainload and the average carload. In view of the heavy loss in traffic the

slight decreases in the trainload and carload are said to indicate close attention to this important feature of operation.

The summary of passenger train performance for March, 1919, shows a decrease of 1.4 per cent in passenger train miles compared with March, 1918, with an increase of 0.2 per cent in passenger train car miles. The average cars per train were 6.2 this year against 6.1 last year.

The figures for the three months' period ending March 31, 1919, are as follows:

INCOME ACCOUNT

3 Months Ending March 31	1919	1918	Increase or Decrease Amount	Per cent
Miles of road operated	231,442	.....	.....	....
Operating revenues..	$1,109,614,242	$928,403,776	$181,210,466	19.5
Operating expenses..	1,015,977,653	802,210,045	213,767,608	26.6
Net operating revenue	93,636,589	126,193,731	d 32,557,142	....
Taxes, rents, et	47,658,837	50,512,243	d 2,853,406	....
Net Federal income..	45,977,752	75,681,488	d 29,703,736	....
3/12 of annual rental	222,143,817	222,143,817	.....	....
Operating loss	176,166,065	146,462,329	29,703,736	....
Operating ratio	91.5	86.5	5.0	....

FREIGHT TRAFFIC MOVEMENT

3 Months Ending March 31	1919	1918	Increase or Decrease Amount	Per cent
Net ton miles.....	85,035,399,000	95,032,526,000	d 9,997,127,000	d 10.5
Freight train miles.	133,328,000	153,287,000	d 19,959,000	d 13.0
Train load (net tons)	638	620	18	2.9
Car load (net tons)..	28.1	28.5	d 0.4	d 1.4
Loaded car miles....	3,026,149,000	3,336,347,000	d 310,198,000	d 9.3
Total car miles.....	4,500,992,000	4,707,875,000	d 206,883,000	d 4.4
Per cent of loaded to total car miles....	67.2	70.9	d 3.7	d 5.2

Uniform Rules and Working Conditions for Telegraphers, Etc.

In Supplement No. 21 to General Order No. 27, Director General Hines has prescribed, effective May 1, rules and working conditions to apply to employees herein named in the service of railroads in federal operation where agreements are not in existence, namely, telegraphers, telephone operators (except switchboard operators), agents (except those specified in Article IV of Supplement No. 13 to General Order No. 27), agent-telegraphers, agent-telephoners, towermen, levermen, tower and train directors, block operators and staffmen. The supplement provides in part:

Employees shall be paid on the hourly basis in accordance with the terms of Supplement No. 13 to General Order No. 27.

The entering of employees in the positions occupied in the service, or changing their classification or work, shall not operate to establish a less favorable rate of pay or condition of employment, than is herein provided.

Where existing payroll classification does not conform to the preamble hereof, employees performing service in the classes specified therein shall be classified in accordance therewith.

When new positions are created, compensation will be fixed in conformity with that of existing positions of similar work and responsibility in the same seniority district.

Eight consecutive hours, exclusive of the meal hour, shall constitute a day's work, except that where two or more shifts are worked, eight consecutive hours, with no allowance for meals, shall constitute a day's work.

Overtime shall be computed at the rate of time and one-half time; even hours shall be paid for at the end of each pay period; fractions thereof will be carried forward.

When notified or called to work outside of established hours, employees will be paid a minimum allowance of two hours at overtime rate.

Employees will not be required to suspend work during regular hours, or to absorb overtime.

When the carrying of United States mail and parcel post by the employees herein specified become unduly burdensome, or interferes with the proper operation of trains, they will be relieved from such work.

An employee disciplined, or who considers himself unjustly treated, shall have a fair and impartial hearing, provided written request is presented to his immediate superior within five days of the date of the advice of discipline, and the hearing shall be granted within ten days thereafter. A decision will be rendered within ten days after completion of the hearing.

If an appeal is taken, it must be filed with the next higher official and a copy furnished the official whose decision is appealed within ten days after date of decision. The hearing and decision on the appeal shall be governed by the time limits of the preceding section.

At the hearing, or on the appeal, the employees may be assisted by a committee of employees, or by one or more duly accredited representatives.

If the final decision decrees that charges against the employee were not sustained, the record shall be cleared of the charge; if suspended or dismissed, the employee will be returned to former position and paid for all time lost.

Committees of employees shall be granted leave of absence and free transportation for the adjustment of differences between the railroad and the employees.

Employees will be in line of promotion, and where ability and qualifications are sufficient, seniority will prevail.

When vacancies occur or new positions are created, they will be advertised to all employees on that division between the first and the tenth of each month (or more frequently if mutually agreed upon), and accepted within ten days thereafter. The position must be permanently filled within 30 days after advertisement.

An employee applying for and being assigned to an advertised position will not be eligible to the position vacated by him until same shall have been declined by all employees on that division, or is advertised a second time.

Unless otherwise mutually agreed upon, office seniority will prevail for telegraphers or telephone operators in dispatching, relay and division offices. When vacancies occur in these offices they will be filled by advancing the regular force, and the last trick left vacant will be advertised to all employees on that division.

Regular relief employees will be allowed $2.00 per calendar day for expenses while away from their headquarters. This article does not apply to extra men.

Typewriters will be furnished at offices where the railroads require their use.

Controversies arising under the application of this schedule of wages and working conditions shall be referred to Railway Board of Adjustment No. 3, in accordance with the provisions of General Order No. 53.

Pullman Annual Passes for General Chairman of Shop Crafts

Approval has been given to issuance of Pullman annual passes to general chairmen of shop crafts, to be made good on railroad or railroads over which such general chairmen have jurisdiction, and also on such foreign lines as they may hold railroad transportation over, which has been furnished to them for the purpose of enabling them to make short cuts between points on the lines over which they have jurisdiction.

Application for these passes should be made by the federal managers to the director, Division of Operation, at Washington.

War Department Desires Information as to Railroad Men With Foreign Experience

As a part of the information which the War Department requires in its records, the chief of transportation, rail transportation branch, United States War Department, Washington, has asked for the following information:

(1) Names and addresses of all employees connected with railroads under federal control who have at any time been employed in an *operating* capacity as engineers, conductors, or higher rating or grades on railroads in any foreign country.

(2) In addition to the names and addresses, information as to the capacity in which employed while on duty with a foreign railroad company, and name of such railroad and its location.

(3) Information as to the qualifications of the persons named for special occupations.

The regional directors are asking the various roads for this information for the War Department, including the employees who served abroad in the war from which we are just emerging.

Search of Baggage of Interstate Passengers by State Prohibition Officers

John Barton Payne, general counsel of the Railroad Administration has issued a circular saying:

"The Railroad Administration has been greatly embarrassed by the efforts of state prohibition officers to enforce prohibition laws, the prohibition commissioners insisting upon the right to search the baggage of interstate passengers while such passengers were passing through prohibition states. The Supreme Court has now decided this can not be done; that interstate passengers are entitled to pass through a prohibition state with liquor in their possession. I have called the attention of the prohibition officers to the opinion of the Supreme Court, and asked them to instruct their officers to comply with the law as now settled."

Railroad Administration Departments Moving to New Building

Most of the departments and sections of the Railroad Administration that have been located during the past year in the Southern Railway building in Washington are moving into the new Hurley-Wright building, across the street from the Interstate Commerce Commission building at Eighteenth street and Pennsylvania avenue. The offices of the divisions of accounting, capital expenditures and public service are already located there and the offices of the Division of Purchases, the engineering and maintenance department, the Operating Statistics Section, and the Safety Section, are also to move from the Southern Railway building.

Passenger Traffic

Passenger traffic during the month of February showed an increase of 8.1 per cent over that of February, 1918, according to the report of the Operating Statistics Section. The number of passengers carried one mile was 3,139,935,739. In the Pocahontas region the increase was 30.3 per cent and in the Eastern region it was 14.2 per cent. None of the regions showed a decrease. For the two months ended February 28 the number of passengers carried one mile was 6,598,643,073, an increase of 9.8 per cent.

Rates for Yard Foremen Acting as Yardmasters

Supplement No. 22 to General Order No. 27 provides that, effective January 1, 1919, where there is no existing agreement or practice more favorable to the employees, the wages for yard foremen who also act as yardmasters (designated in some schedules as "foot board" yardmasters) will be not less than 40 cents per day in excess of the yard foremen's rates. The same rules for the basic day and overtime shall apply to such employees as applies to other yardmen.

The Effect of Cinder Fill on Locomotive Water Supply

By William M. Barr
Consulting Chemist, Union Pacific System, Omaha, Nebr.

WATER PERCOLATING through cinders dissolves large quantities of scale-forming material and increases the corrosive properties of the water. Steel pipe laid in cinder fill is soon destroyed, and even cast-iron pipe under the same conditions is short-lived.

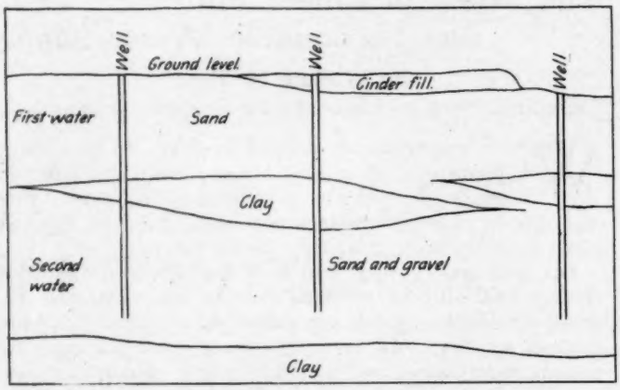
Distilled water which had been poured over cold fresh cinders and allowed to stand for 48 hrs. contained 123 grains of dissolved solids per gallon, 42 grains of this being calcium sulphate. Large quantities of other calcium compounds were present, and a natural water coming in contact with such material would have both the temporary and permanent hardness greatly increased.

Samples of Scale Produced by Water That Had Seeped Through the Cinder Fill

Several cases have been reported where water percolating through cinder fill has increased the hardness of surface water supplies. Such water has been made unfit for boiler purposes because of the very hard scale that it would deposit on the flues. The writer has observed a case where water at a depth of 65 to 75 ft. has been changed by cinders at the surface, and it is interesting to note that this is the second water sheet and not the normal surface supply. The second water in this region is cut off from the first or surface water by impervious clay sheets which in places are several feet thick. Drilling a large number of test holes developed the fact that these clay sheets are lenticular, and drilling

showed but four or five inches of clay in places. As this sheet appeared to be constantly thinning in one direction, it is probable that it runs out entirely, thus letting the top water down to mix with the second water, which occurs at a depth of 60 to 75 ft. The underground flow in this region is from northwest to southeast.

Analyses Nos. 1, 2, 3, 4 and 5 represent the normal water of the region as it occurs below the first clay sheets. Nos. 1 and 2 are about 4,000 ft. north of the wells that show the effect of cinder fill. No. 3 is two miles west, and No. 4 is approximately 3,500 ft. east, while No. 5 is about 4,000 ft. west. There has been a considerable quantity of cinders spread in the region of No. 5, and the effect is shown in the analysis of No. 6 which is from the same well. Sample



Sketch Showing Probable Form of the Clay Sheets that Permits the Second Water to Be Contaminated by the Seepage from the Cinder Fill

No. 5 was taken in 1894 and No. 6 was taken in 1916, indicating the increase in incrusting solids which has developed.

In the region most affected, there has been from 10 to 20 ft. of cinders filled into the low ground. Analysis No. 7 is a mixture of water from twelve wells in this region, and 8, 9, 10 and 11 are from four of these wells selected at random. All show heavy increases in calcium sulphate and magnesium sulphate, as well as some increase in calcium carbonate. All of the wells are approximately the same depth if due allowance is made for the surface contour.

Water from these 12 wells was used in locomotives for many years until the consumption at times reached 1,000,000 gals. per day. The use of this water resulted in heavy hard scale on flues and fireboxes, with constant leaks in the flue sheets and much pitting. The water shown in Analysis No. 1 was then developed and pumped into the tank through 4,000 ft. of 10-in. pipe line. The result is that scale is light, leaks have stopped, and there is practically no corrosion resulting from the new water.

The photograph shows scale removed from switch engines operating at this station, before and after the change was made in water supply.

This illustrates the importance that should be attached to local ground conditions when developing new water supplies, even when the water comes from a considerable depth.

ANALYSES OF NORMAL AND CINDER IMPREGNATED WATERS

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11
Silica	1.59	1.44	1.35	1.89	1.61	1.52	1.44	1.67	1.59	1.72	1.32
Oxides of iron and aluminum	.12	.27	.35	.23	...	.12	.29	5.95	1.29	.20	.56
Calcium carbonate	5.60	4.29	5.17	4.90	4.51	4.61	7.43	8.74	5.30	6.24	3.98
Magnesium carbonate	...	1.07	1.88	1.04	1.29	4.51	5.30	.54	7.42	.52	.37
Calcium sulphate	...	...	.38	...	.12	2.77	5.54	5.37	4.74	5.04	6.25
Magnesium sulphate	...	...	...	...	...	1.20	3.34	3.49	2.07	2.59	3.42
Alkali carbonates	...	.46	...	1.53	2.90	...	...	...	...	...	...
Alkali sulphates	3.61	.32	.50	.99	.62	...	...	4.87	...	1.52	1.26
Alkali chlorides	1.53	.15	.15	.05	.78	.50	.75	.75	.60	.65	.50
Alkali nitrates	...	.03	.01	.02	...	.03	.06	.15	.15	.15	.08
Total solids	12.45	8.03	9.79	10.65	10.93	15.26	24.15	31.53	23.16	18.63	17.74

Analyses shown in grains per U. S. gallon.

Tonnage Rating Charts for Standard Pacific Type Locomotives

IN THE *Railway Age* of October 4, 1918, was begun the publication of a series of charts prepared by H. S. Vincent, from which the tonnage rating of the United States Railroad Administration standard locomotives can be determined for any condition of grade, curvature or frictional resistance.

In this issue are given charts for the light and heavy standard Pacific type locomotives, description of which appeared in the *Railway Age* of April 11, page 951.

The tonnage rating charts are so designed that the maximum hauling capacity of the locomotives in tons of 2,000 lb. can be read directly from them for any combination of speed and grade within the given limits.

TABLE I—FRICTIONAL RESISTANCE OF FREIGHT CARS
Speeds 5 to 30 M.P.H.

Weight in tons		Resistance, lb. per ton	
Loaded	Empty	Loaded	Empty
15	6.0	6.40	10.30
20	7.8	5.91	9.60
25	9.5	5.44	9.05
30	11.1	5.07	8.45
35	12.6	4.74	8.05
40	14.0	4.40	7.65
45	15.3	4.18	7.26
50	16.5	3.90	6.85
55	17.6	3.65	6.50
60	18.6	3.43	6.26
65	19.5	3.24	6.00
70	20.3	3.07	5.82
75	21.0	2.90	5.63

The drawbar pull, which varies with the resistance, is shown on the charts by the inclined parallel lines, and is read on the left margin. On straight, level track this equals the tractive effort of the locomotive less the frictional resistance of engine and tender. The tonnage curves are based on a frictional car resistance of four pounds per ton, which is a good average for the usual mixed freight trains with varying weight of cars and loading, with the rolling stock and roadbed well maintained.

The tonnage can be read from the charts for any other car resistance factor or for any combination of resistances, simply by converting them into terms of grade on the following basis:

One pound car resistance = .05 per cent grade.
One degree curve uncompensated = .04 per cent grade.

While the frictional car resistance of four pounds per ton applies only to freight service, to avoid confusion the charts for passenger and express service locomotives have

also been based on a resistance of four pounds per ton, and in every case adjustment must be made for the increased resistance of passenger and express cars.

TABLE II—FRICTIONAL RESISTANCE OF FREIGHT CARS
From Bulletin No. 43—University of Illinois—Edward C. Schmidt

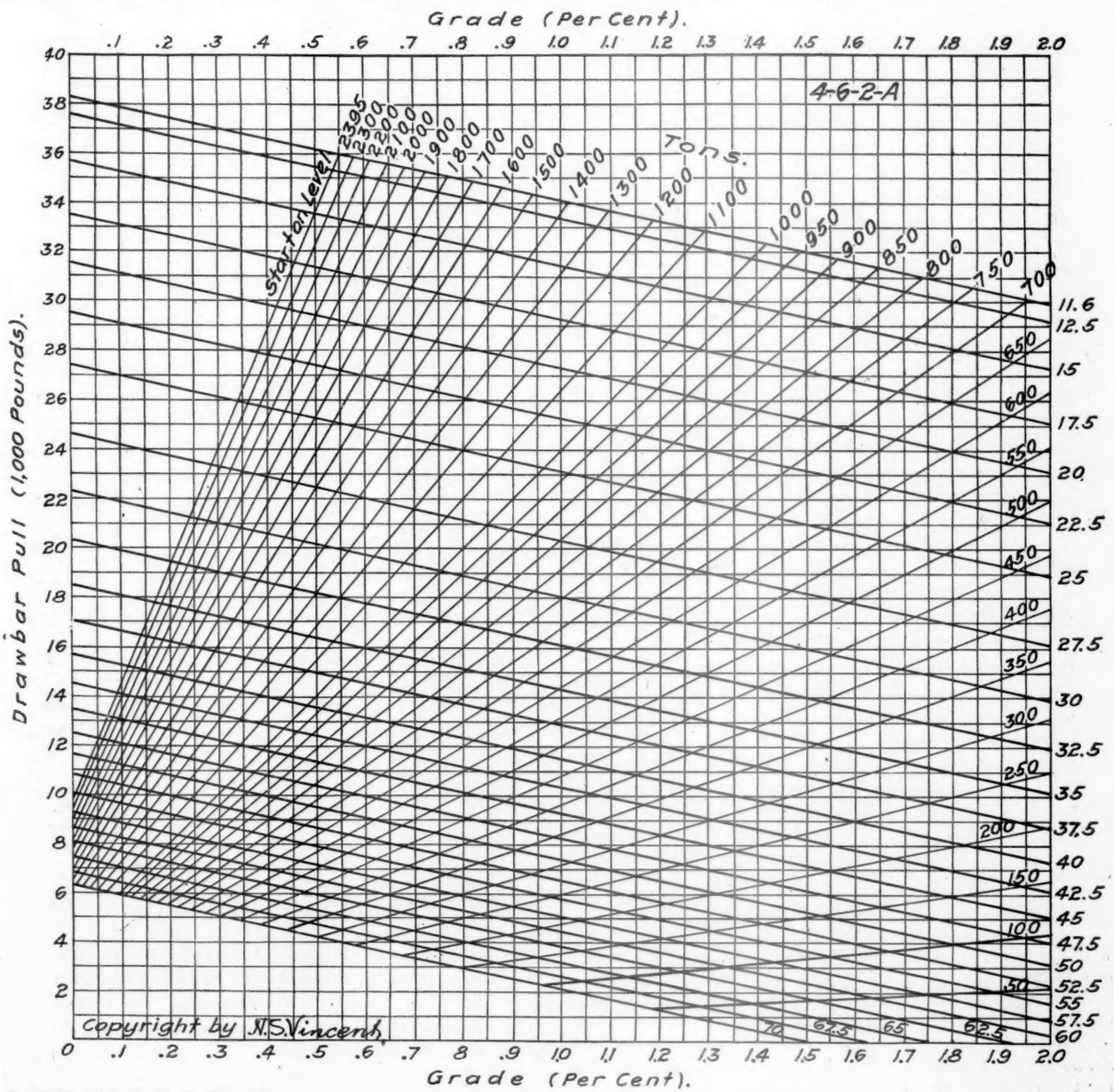
Speed, miles per hour	Train resistance, lb. per ton. Column headings indicate average weights per car												
	15	20	25	30	35	40	45	50	55	60	65	70	75
6....	7.7	6.9	6.1	5.5	4.9	4.4	4.1	3.8	3.5	3.3	3.2	3.1	3.0
8....	8.0	7.1	6.3	5.6	5.0	4.6	4.2	3.9	3.6	3.4	3.3	3.2	3.1
10....	8.2	7.3	6.5	5.8	5.2	4.7	4.3	4.0	3.7	3.5	3.3	3.2	3.2
12....	8.4	7.5	6.7	6.0	5.4	4.8	4.4	4.0	3.8	3.6	3.4	3.3	3.3
14....	8.7	7.8	6.9	6.2	5.5	5.0	4.5	4.2	3.9	3.7	3.5	3.4	3.4
16....	9.0	8.0	7.1	6.4	5.7	5.1	4.7	4.3	4.0	3.8	3.6	3.5	3.5
18....	9.3	8.3	7.4	6.6	5.9	5.3	4.8	4.5	4.1	3.9	3.7	3.7	3.6
20....	9.6	8.5	7.6	6.8	6.1	5.5	5.0	4.6	4.3	4.0	3.9	3.8	3.7
22....	9.9	8.8	7.9	7.0	6.3	5.7	5.2	4.8	4.4	4.2	4.0	3.9	3.8
24....	10.2	9.1	8.1	7.3	6.6	5.9	5.4	4.9	4.6	4.3	4.2	4.1	4.0
26....	10.5	9.4	8.4	7.5	6.8	6.1	5.6	5.1	4.8	4.5	4.3	4.2	4.1
28....	10.9	9.7	8.7	7.8	7.0	6.3	5.8	5.3	4.9	4.7	4.5	4.4	4.3
30....	11.3	10.0	9.0	8.0	7.3	6.6	6.0	5.5	5.1	4.9	4.7	4.5	4.5
32....	11.6	10.4	9.3	8.3	7.5	6.8	6.2	5.8	5.3	5.0	4.9	4.7	4.6
34....	12.0	10.7	9.6	8.6	7.8	7.1	6.5	6.0	5.5	5.3	5.1	4.9	4.8
36....	12.5	11.1	9.9	8.9	8.0	7.4	6.7	6.2	5.8	5.5	5.3	5.1	5.0
38....	12.9	11.4	10.2	9.2	8.3	7.6	7.0	6.5	6.0	5.7	5.5	5.3	5.2
40....	13.4	11.8	10.6	9.5	8.6	7.9	7.3	6.8	6.3	6.0	5.7	5.6	5.5

For example: Find the tonnage which can be hauled in passenger service by the standard light Pacific type locomotive on a 0.5 per cent grade combined with a four degree uncompensated curve at 40 m. p. h.

From Table III it is found that the resistance of passen-

TABLE III—FRICTIONAL RESISTANCE OF PASSENGER CARS

Speed, m.p.h.	Resistance, lb. per ton	Speed, m.p.h.	Resistance, lb. per ton
5	5.89	42.5	6.90
7.5	5.60	45	7.20
10	5.51	47.5	7.35
12.5	5.42	50	7.85
15	5.42	52.5	8.30
17.5	5.42	55	8.65
20	5.46	57.5	9.03
22.5	5.48	60	9.45
25	5.60	62.5	9.95
27.5	5.70	65	10.42
30	5.85	67.5	10.95
32.5	5.95	70	11.45
35	6.20	72.5	12.00
37.5	6.40	75	12.60
40	6.65	77.5	13.20
....	....	80	13.85



Tonnage Rating Diagram for the United States Railroad Administration Standard Light Pacific Type Locomotive

ger coaches at 40 m. p. h. is 6.65 lb. per ton. The equivalent grade therefore is:

0.5 + (4 × .04) + (6.65 — 4) × .05 = 0.7925 per cent.

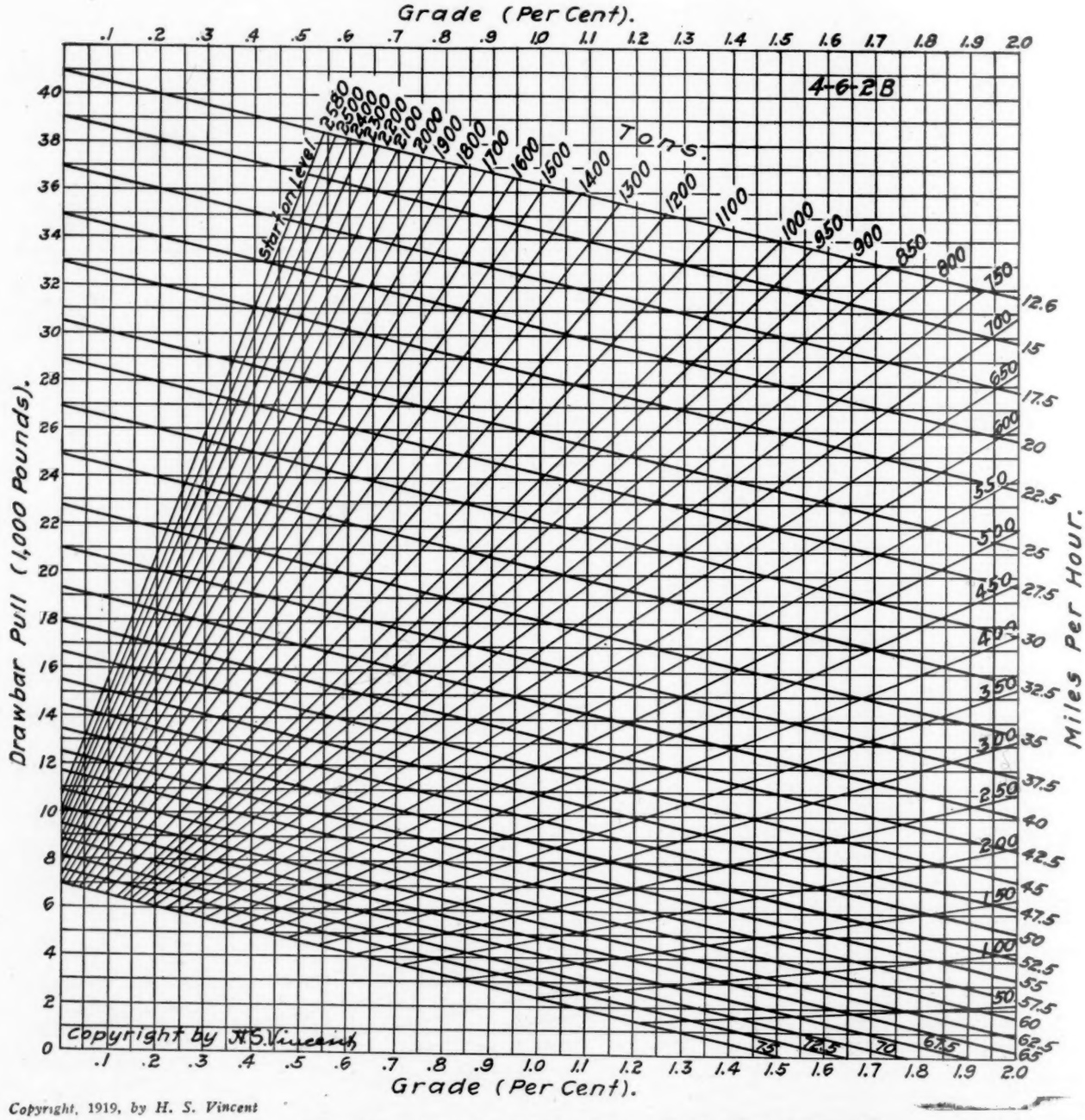
From the chart for the light Pacific type locomotive, at the intersection of the ordinate for 0.7925 per cent grade with the drawbar pull curve for 40 m. p. h., we find a rating of 625 tons.

Similarly for the standard heavy Pacific type locomotive operating on 0.3 per cent grade combined with a four degree uncompensated curve at a speed of 45 m. p. h., Table III shows for this speed a resistance of 7.20 lb. per ton, and the equivalent grade is:

0.3 + (4 × .04) + (7.20 — 4) × .05 = 0.62 per cent grade.

Referring to the chart for the heavy Pacific type locomotive, at the intersection of the ordinate for 0.62 per cent grade with the drawbar pull curve for 45 m. p. h., it will be found that the capacity of the locomotive is 845 tons.

No allowance has been made for weather or temperature conditions or for drop in boiler pressure. In rating the locomotive a deduction should be made from the maximum capacity as given in the charts to suit local conditions.



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Tonnage Rating Diagram for the Standard Heavy Pacific Type Locomotive

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The American Electric Railway Association will hold its thirty-sixth annual convention at Young's Million Dollar Pier, Atlantic City, N. J., on October 6, 7, 8, 9 and 10. The chairman of the convention committee is L. S. Storrs, president of the Connecticut Company, New Haven, Conn.

Railway Developments in Foreign Countries

$20,000,000 for Trans-Siberian; Electrification in France; Earnings of Chinese Railways

ITALIAN RAILWAY EMPLOYEES, according to a Havas press despatch, have been granted by ministerial decree an eight hour day with one day off in seven.

A French commission sent to this country to investigate electrification of steam railroads has recently visited the Norfolk & Western to inspect that railroad's electrified line. The commission comprises thirteen railway officials and electrical experts, headed by Professor Mauduit, of the University of Nancy, and Major d'Anglards, representing the Ministry of Transports. Special study will be made of a number of lines.

A Tunnel Under Gibraltar

A committee of financiers, with headquarters in Barcelona, Spain, has been formed recently to carry out the necessary soundings and other preliminary work in connection with a tunnel under the Straits of Gibraltar. It is proposed that the tunnel should start at a point just west of Tarifa, in Spain, and end to the east of Tangiers, in Africa.

The Electrification of French Railways

M. Cels, under-secretary for public works and transports, stated recently that he will introduce in the French Chamber a bill for the utilization of water power in France by absorbing all private undertakings into one combination. The greater part of the power thus obtained will be allotted for the electrification of the main railway systems of France. The electrification of the Midi has already been begun, the water power of the Pyrenees being brought into use. For the Paris-Lyons-Mediterranean Railway the power will be found in the Alps. The bill has also in view the improvement of lighting, tramway traction, and a system of pumping for feeding agricultural irrigation and local industries.

Trans-Australian Needs Equipment

It is announced in Australia that owing to the increasing volume of traffic on the recently completed Trans-Australian Railway (which links up Western Australia with the Eastern States of the Commonwealth), the rolling stock is insufficient for further requirements. Additional sleeping cars will be acquired and possibly other equipment. Presumably the cars in question will be built in Australia, although parts may be purchased elsewhere, possibly in the United States.

$20,000,000 for Trans-Siberian

The United States and Allied governments have decided to lend to the interallied commission administering the Trans-Siberian Railroad $20,000,000 for operating the line, according to a statement issued by the State Department at Washington, Monday.

It has not been determined what proportion of the loan each of the governments will assume, but it is believed that the United States, Japan and Great Britain each will furnish $5,000,000, and that France and Italy each will be invited to supply $2,500,000.

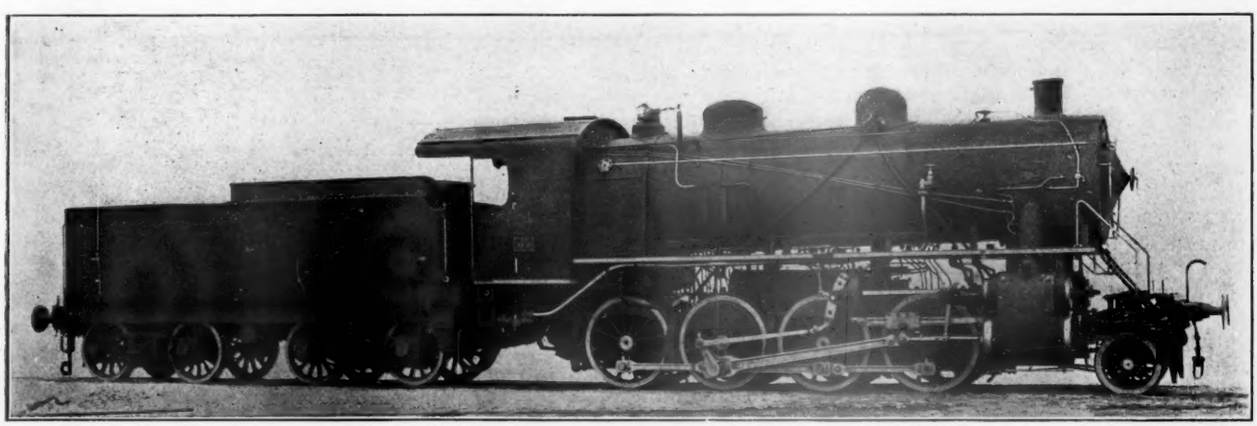
By making the loan direct to the interallied commission, the governments evade the question of recognition of the Omsk government. It was deemed inadvisable, in the absence of recognition, to make the loan to the Omsk government, and the arrangement agreed upon does not raise the question of recognition in any sense.

The absence of guarantee excluded participation by private bankers in the loan. It is stated that the loan will not be made as an investment, but to assure the continued operations of the trans-Siberian line. It is thought that the refunding of the loan will be requested later.

Paris-Constantinople Railway Service

The announcement of the resumption of the Paris-Constantinople service by the International Sleeping Car Company, which appeared in a recent issue of the *Railway Age,* is supplemented by some additional facts from a recent issue of the Near East, which says:

> The reestablishment of the Orient Express between Paris and Bucharest is a foretaste of the facilities for reaching all parts of the Near East that will be provided in due course of time by the International Sleeping Car Company. H. M. Snow, agent general for the company, discussing this latest development, said that at present the trains are running twice weekly and that direct connections with Warsaw and Prague have been made.
>
> The route, he pointed out, is from Paris to Basle, Zurich, Vienna, Budapest and Bucharest. A section is detached at Linz for Prague, and another



Consolidation Locomotive for the Italian State Railways

The American Locomotive Company has this week received orders for 150 more of these locomotives, making a total of 400 ordered of that company by Italy since the first order in 1916. The locomotives are superheated and have 21¼ in. by 27½ in. cylinders; 53⅛ in. driving wheels; a total weight in working order of 146,000 lb.; a weight on drivers of 128,000 lb., and a maximum tractive effort of 33,400 lb.

section at Vienna for Warsaw. The time required for the journey from Paris to Vienna is now 38 hours, as against 35 when the route crossed the corner of Germany. Of course the speed is necessarily very limited as the railways have suffered severely as the result of more than four years of war. No doubt when normal conditions obtain, this new service will be at least as good as formerly, and the route will have the advantage of avoiding German territory. The trip from Vienna to Bucharest takes another 11 hours, making the time for the whole journey 49 hours. With regard to passenger facilities, the service at present exists primarily for officials, and no one can travel by the train without special permission from the French Ministry of War.

After peace is signed, Mr. Snow continued, the Orient Express may be running all right to Constantinople, but at present the only method of reaching there is by way of Constantza. We can get now only as far as Fetesti, and there the river must be crossed in boats. When the Orient Express service is resumed to Constantinople it will be established on the old route—via Belgrade and Sofia.

As regards the connections with Greece, a section will be detached at Nish and will run via Uskub to Salonika, Lariswa and Athens. Then there are numerous connections in Bulgaria and elsewhere that will presently be restored.

This covers the immediate developments contemplated by the company as regards the Near East, but Mr. Snow pointed out that only time and settled conditions were required for much wider schemes. The time is certainly not far distant, he said, when Constantinople will no longer be the terminus of the Orient Express. Steamers will be used to take the trains across the Bosphorus, and a service will be established to Aleppo and from there to Bagdad. At Aleppo a section will be detached for the Syria and Palestine service, and eventually the trains on this route will be able to go as far as Egypt.

Exports of Steel Rails and Other Railway Track Material

(Prepared by the Division of Statistics, Bureau of Foreign and Domestic Commerce.)

Another chapter in the story of American steel and the part it will play in reconstruction and in the extension of lines of communication throughout the world is written in the export statistics of rails, railroad spikes, and other iron and steel railway track materials, such as switches, frogs, fishplates, splice bars, etc., shipped to foreign countries since the armistice was declared. The quantity and value of these products exported during the four months ended with March, the average monthly price thereof in December of each year, and the shipments during the calendar years 1911 to 1918 are given below:

	Steel rails			Railroad spikes *a*		Other railway track material (value) *a*
Calendar year	Tons	Value	Price per ton in December	Pounds	Value	
1911	420,874	$12,229,045	$29.11	.....	.....	.....
1912	446,473	13,053,774	29.62	.....	.....	.....
1913	460,553	13,979,549	31.23	25,375,827	$483,283	$3,088,866
1914	174,680	5,103,918	27.05	15,489,687	258,808	1,775,391
1915	391,379	12,095,170	32.65	29,693,252	591,752	4,857,047
1916	540,828	20,417,582	38.43	53,428,813	1,489,091	6,540,187
1917	512,669	24,013,090	52.65	47,467,317	2,009,808	8,194,270
1918	453,944	26,440,780	60.80	22,330,104	1,229,083	5,546,960
December, 1918	44,982	2,735,544	60.80	1,708,554	116,787	541,522
January, 1919	65,024	4,221,563	64.90	3,509,054	189,408	543,330
February, 1919	66,900	4,611,982	68.94	4,206,228	258,073	905,264
March, 1919	48,955	3,051,611	62.30	4,185,816	193,987	515,535

a Not separately stated prior to July 30, 1912.

Countries of Shipment

An analysis of the advance figures for March shows a distribution of American steel rails extending to 23 countries, about 18,000 tons, or over one-third the total exportation, going to France. Cuba, Japan and Canada were also large purchasers during recent months.

Early in the history of the steel industry there arose the foreign demand for American steel rails, developing from an average annual exportation of less than 300 tons in the period 1867-1870 to an average of 474,705 tons during the four calendar years of the war period 1915-1918, although the exports did not reach six figures until near the end of the century. From 1900 the volume increased, with slight fluctuations, from year to year, until the record-breaking shipments of 540,828 tons, valued at $20,417,582, occurred in the calendar year 1916. The total shipments of steel rails for the four-year war period were 1,898,820 tons, invoiced at $82,976,622, as compared with 1,502,580 tons, worth $44,366,286, exported during the pre-war period of four calendar years, 1911-1914, representing an increase of 26 per cent in tonnage and 86 per cent in value of the total shipments during the war period over the exports for the previous four years.

Like other great staple commodities, the value of steel has soared to unprecedented heights during the war and since the armistice, the average monthly export price of steel rails during the war culminated in the record figure of $62.20 per ton in November, 1918, $68.94 per ton being reached in February, while the advance figures for March would indicate a price of $62.30 per ton on foreign shipments.

In addition to $82,976,622 worth of steel rails shipped during the four-year war period, railroad spikes valued at $5,319,734 and other track material valued at $25,138,473 were exported; or a total of $113,434,829 for all iron and steel railway track materials.

While a greater quantity of these products was shipped to France than to any other country during the war, it is noted that with this single exception Cuba has recently become the leading market for steel rails exported from the United States. From comparatively modest purchases prior to the war, Cuban imports of this commodity during the last three calendar years reached a total tonnage of 187,798, valued at $8,146,383; as compared with 159,335 tons, invoiced at $9,812,418, shipped to Japan; 155,932 tons, worth $6,565,708, to Canada, and less amounts to other countries during the same period.

Railway Notes From China

[From Our Special Correspondent in Peking]

A short time ago, the allied ministers made a representation to the Chinese government demanding that the interference with the Peking-Mukden railway by Chinese soldiers be abated, and that all such forces stationed along the railway between Peking and Shanhaikuan be removed. This action was taken under the authority of the Boxer protocol which provides that the Peking-Mukden railway shall be open from Peking to the sea, and that the allied nations may establish garrisons at several points to enforce the provision. While allied garrisons have been maintained at several points ever since 1900, during the past five years, no objection has been made to Chinese garrisons also. As a result, the line was broken for several days during the attempted Imperial restoration during 1917. The recent abuse of freight equipment by Chinese soldiery, and the constant threat which these troops represent to the authority of the central government of China, has resulted in consideration of ways and means to put the Boxer protocol back into force. This consideration was brought to a decision by recent rough handling given some of the foreign staff of the Peking-Mukden line by Chinese soldiers at Tientsin.

The Chinese Ministry of Communications has given out the following condensed operating and income statement covering the year 1917:

		Comparison with 1916	
	1917	Increase	Decrease
Operating revenues	$63,873,704	$1,111,983	.....
Operating expenses	30,040,565	1,198,287	.....
Net operating revenues	33,833,139	.....	$86,303
Income debits	13,303,911	.....	663,975
Income credits	1,101,028	325,769	.....
Net income debits	12,202,943	.....	989,744
Surplus for the year	21,630,196	903,440	.....

These operating expenses contain charges to the amount of $1,837,819 to cover depreciation on rolling stock. Data from the Canton-Samshui line is not contained in the above, for the reason that this line was in the hands of the rebellious southern authorities. Its surplus is annually in excess of $400,000. It should be remembered in this connection that two important lines were seriously interfered with by floods. Through trains could not be run on the Peking-Hankow from July 27 to October 29, and the north end of the Tientsin-Pukow together with considerable equipment was similarly cut off from August 8 to November 26. Several other lines had lesser interference from the same cause.

Income charges above stated contain slightly over $10,-

400,000 interest and $2,100,000 loss on depreciated currency. In gaging the above results it must be remembered that favorable rates of exchange reduce interest charges to about 3½ per cent upon the nominal debt outstanding, while revenues contain a large quantity of depreciated bank notes which are included at par. Expenses, on the other hand, are paid almost entirely in silver. The result is that after a nominally prosperous year the more important lines found themselves hard up for ready cash.

Nominal net operating revenue represents a return upon cost of road and equipment of 8.2 per cent. The Peking-Mukden and the Peking-Hankow, the two oldest lines, had returns of 17.1 and 11.8, respectively, stated on this basis. The operating ratio was 47. The two lines just mentioned had operating ratios of 38 and 37, respectively. This compares very favorably with American experience, as well as with other countries. Note the following for the year 1913: Austria, 76 per cent; France, 63 per cent; Germany 70 per cent; India, 52 per cent; Japan, 48 per cent; United States of America, 69 per cent.

Three full years are now available for comparison under the uniform classification of accounts. The final surplus for each of these three years is as follows:

	Surplus	Increase over 1915
1915	$9,671,535	.....
1916	20,726,755	$11,055,220
1917	21,630,196	11,958,661

The surplus remaining after all charges for the year had been paid in 1915 was equivalent to 9 per cent upon the investment made by the government in these lines. In 1916 it jumped to 17.7 per cent, and in 1917 amounted to 18.8 per cent.

Announcement is also made of the approximate return of traffic for the year 1918. Total revenues are stated at $75,539,739. These include revenues from a section of the Canton-Hankow line, which was put into restricted operation during the year. These amount to $323,042, so that the lines reporting in 1917 had a revenue of $75,216,697 in 1918. This is an increase of $11,300,000 in round numbers. While operating expenses will naturally show considerable increase also, it is not believed that such increase will be more than one-fourth of the increase in revenue. The Peking-Mukden, which has closed its books for 1918, reports an increase in revenue of $3,857,000 with an increase of only $374,000 in expenses, bringing about a reduction of operating ratio to 33 per cent.

Japanese interests are pressing surveys and preliminary work for an extension of the Ssupingkai-Chenchiatun railway westward to Ha-ma-til-ya. This extension will carry Japanese construction westward of the American Aigun-Chinchow route. The considerations which motivate this activity are almost entirely political, for there is no population to speak of, no industries nor mines to be served by the extension. But if the Aigun line should be built first, the American concessionaires would be in a position to demand all minor westward lines as branches, and thus definitely confine Japanese activity to the eastern portion of Manchuria. Japanese activities in Mongolia are such that it is very apparent that such a limitation to her field of influence is furthest from her thoughts. In order to preserve her connection with this hinterland and if possible establish a plausible claim to a broad zone between Siberia and the Eighteen Provinces of China, Japan must drive her rail lines westward. Once in the field she will also be in a better position to support her objection to the construction of the Aigun Chinchow line by the Americans, and if successful will be entirely free to oppose the unification movement and to work her will on north China.

Preparations are being made to double track a short section of the Peking Hankow line, just south of Peking.

Some Comments on the Lisman Plan

THE SUGGESTION by F. J. Lisman that railroads of the country be combined end to end so as to form light strong competitive systems was published in the *Railway Age* in the issues of March 28 and April 4.

The Globe (New York) on April 29 published an interview by Brice Bliven with Walker D. Hines, director general of railroads, which contained the following:

I had the privilege the other day of hearing Mr. Hines explain his idea as to what should be done with the railroads.

Here in a nutshell is the Hines plan:

Return the railroads to private ownership, but limit the profits to a certain percentage—probably 6 per cent—and give the government part of all earnings above that amount.

Create out of the 170 railroads which the government took over not more than ten or twelve big new railroad systems. Make each system a combination of some strong and some weak roads.

Get a new basis for valuation of the lines, based partly on their actual physical worth and partly on their proven earning power. Give the stock and bondholders new stock or bonds in accordance with the resulting capitalization of the railroads. Let the government guarantee to the stockholders a moderate rate of interest on their investment. Have the government represented on every board of dirctors, and let these government directors form part of the rate-making body, whatever it may be (not the present Interstate Commerce Commission, probably).

Many of the plans Mr. Hines has for disposal of the railroads are taken from the general scheme drawn up by F. J. Lisman of F. J. Lisman & Co. I don't know Mr. Lisman from Adam, but I think it is only fair to say that as a demonstration of sheer power to think I have rarely seen anything more interesting than his plan, which he calls "A Possible Solution of the Railroad Problem." Since Mr. Hines is showing more and more inclination to go over to this plan in its entirety, it is worth while to describe some of its features. * * * * *

An Executive Point of View

The following is an abstract of some letters exchanged between Mr. Lisman and an executive officer of one of the large eastern trunk lines:

Dear Mr. Lisman:—

I had the pleasure last night of reading over carefully your plan for the rehabilitation of the railroads. It is extremely interesting and of real constructive value and will be useful to the commission which I hope the new Congress will appoint, as soon as it is organized, to study the railroad situation and recommend a plan.

I don't agree entirely with some of your conclusions; especially that it would be wise to consolidate all the railroads of the country into a few big systems, because it will result, which appears to be part of your plan, in the strong systems being loaded with the weak sisters and every corporation that would naturally be able to earn a good dividend would be consolidated with a lot of bankrupt properties, so that the whole railroad system of the country would be reduced to the dead level of being barely able to live, unless the rates were made pretty high.

My experience in corporations is that no corporation as big as the ones you provide for can be managed to the best advantage, because the work and responsibility placed on each officer would be so great that it would largely have to be done by assistants and clerks and would lose the personal touch. * * * * * The weakest point in the United States Railroad Administration is that the officers are trying to do more than they can do properly, with the result that the roads are being run on "General Orders" with no pos-

sibility of their being adjusted to fit each particular case. The result is the most ridiculous overpayment in some cases and insufficient payment in others, and also the inability to recognize superior efficiency by promotions and increasing wages or of getting rid of inefficient help by demotions or discharge.

Whatever plan is adopted, it seems to me, must provide for allowing the initiative on the part of the corporations to remain and for some regards for careful operation. If the government guarantee a dividend those roads that could not ordinarily earn such a dividend will sit down quietly and live on it, with no hope of making anything extra. To get the best results the rewards offered for economical and efficient operation and the use of the best possible brains and judgment should be large enough to enable the corporation to pay good salaries and secure the most competent men. It seems to me that in your plan the amount of excess earnings to be divided to labor in bonuses is too large and the amount to go to the corporations too small to insure the best results.

EXECUTIVE OFFICER.

DEAR MR. EXECUTIVE:—

Your particular criticism can be put under two heads

1. The proposed systems are too large for proper supervision.

2. The incentive to do good work is taken away by putting all companies more or less on a dead level.

I admit there is much force to the criticism that the systems are too large. I should have perferred to have kept the proposed systems down so they would not exceed 20,000 miles, but under my plan I somehow had to take care of the roads in the Southwest as there are practically no strong roads in that region, outside of the Southern Pacific and the Atchison, Topeka & Santa Fe. It was, therefore, necessary to link a number of lines with very weak credit to strong lines in the Northwest and Northeast. Besides, there are a number of systems with a substantial capitalization in other sections of the country, which are weak and their burden therefore had to be pro rated among several strong lines. The systems are so very large, however, that they really have to be divided into regional districts, both for the purpose of more effcient operation and in order to enable the Interstate Commerce Commission to keep a record of the earnings, or rather of the result of rates, as same may prevail from time to time.

It seems to me such sub-division after all, should be no more difficult than the present sub-division, under which the Santa Fe System keeps separate accounts for its Gulf, Colorado & Santa Fe and its Pacific Coast Lines. The Southern Pacific keeps a separate account for many companies; in fact for many more than would become necessary hereafter.

The Pennsylvania System up to now, has kept up its separate organization for the lines east and west of Pittsburgh, and I believe that it is the intention to keep up this separate organization in spite of the fact that the Pennsylvania Company, which operates the lines west of Pittsburgh, is to be or has been liquidated.

As to the incentive being taken away, it is quite true that if the companies are practically going to be limited to 6 per cent dividends the incentive for great improvements or great efficiency is not quite as great as it has been heretofore. In order to overcome this, I have worked out the following:

1. The directors personally are to receive additional compensation for increased dividends.

2. A substantial proportion of increased net results are to go to labor.

3. The Board of Directors is in no way restrained from paying good salaries to efficient men.

Let us assume some such plan as mine were to be put into effect. We would then have, say, eight national railway systems, with probably an average of five sub-divisions or districts. The Northern, Central and the Union Railways would compete with each other; they would each have their Atlantic, Central, Western, Pacific and other divisions. The results of the operation of these divisions would continue to be published and compared with each other, the same as now. The officials in charge of these divisions, as well as their sub-divisions, would still each be keen to show good results in the expectation of recognition of their work by increased salary or promotion.

The gist of the proposition is that the Government cannot have full control; the public cannot have competition and close regulation, and at the same time get the fullest benefits of the previous system of private management and personal incentive. It should be possible though to arrive at some compromise by which the best features of private management can be combined with the desires of the public.

F. J. LISMAN.

Movement of Troops for New York Parade

FOR THE PARADE of the 77th Division of the army, which took place in New York City on Tuesday, May 6, the soldiers had to be moved from and to the camp 20 miles east of New York, by the Long Island Railroad, and the total train movement over the company's lines between New York and Camp Upton for the week of May 4-10, was one of the heaviest on record—and exceedingly heavy records have been common on this road ever since this country first entered the war.

A total of 19,288 men were carried westward—Camp Mills to Long Island City—on Monday, the 5th, in 28 trains of 11 cars each. The first of these trains left the camp at 7 a. m. and the last one at 1:50 p. m. The running time (20 miles) is about 40 minutes. The trains carried from 500 to 800 men each, but on one there were 952—16 officers and 936 men.

The troops were taken from Long Island City across the East River to Manhattan in the railroad company's ferryboats, each boat carrying two or three trainloads.

This part of the Long Island road is traversed by large numbers of regular trains, about three-fourths of the distance between Long Island City and Camp Mills being a three-track or four-track line. For the rest of the distance the line is two-track.

In the movement from the city (eastward) on Wednesday, the 7th, 21 trains were run to Camp Upton, 60 miles from Long Island City, and 8 to Camp Mills; the number of coaches used was 324, as compared with 308 on Monday. The movement was spread over a longer time, the first train starting at 7:57 a. m., and the last one 7:10 p. m. The trains from and to Camp Mills were electrically propelled while those from and to Camp Upton were hauled by steam locomotives.

The total troop movements to and from Camp Upton and Camp Mills, for the whole week, seven days, amounted to 172 trains carrying 100,238 men, equal to an average daily movement of 25 trains and 14,320 men. The number of trains moved each day, including both eastbound and westbound, was: Sunday, 22; Monday, 37; Tuesday, 27; Wednesday, 37; Thursday, 11; Friday, 26; Saturday, 12.

All of these special trains had to be made up at the yard in Jamaica, situated about half-way between the western terminus and Camp Mills, so that the actual train mileage (empty and loaded) incident to the movement of troops was about double that indicated in the second and fifth paragraphs, above.

General News Department

The Association of Railway Executives, T. DeWitt Cuyler, chairman, meets in New York city today, Friday.

The Brotherhood of Railroad Trainmen began its triennial convention at Columbus, Ohio, on May 14. The service flag unfurled contains 840 gold stars. Director General Walker D. Hines is announced to address the convention on Tuesday, May 20.

The State of Texas has secured a temporary injunction prohibiting the Galveston, Harrisburg & San Antonio from further removing and abandoning its track between Blodgett, Texas, and West Junction, a distance of 6 miles. The attorney general also asked for a mandamus to require the restoration of tracks already taken up and to pay a $5,000 fine.

The Order of Railway Conductors is holding its triennial convention at St. Louis, Mo., and, according to St. Louis papers, the convention brings 6,000 visitors to the city. Tomorrow (Saturday) the conductors and their families will go by special train to French Lick Springs, West Baden, Ind., 230 miles from St. Louis, where they will be the guests, over Sunday, of Thomas Taggart.

Col. Frederic A. Delano, formerly president of the Wabash and later of the Chicago, Indianapolis & Louisville, who resigned as member of the Federal Reserve Board to go into the army, has been made a Chevalier of the Legion of Honor, in recognition of his services as deputy director general of transportation for the A. E. F. He entered the service as a major and was promoted to lieutenant colonel and later to colonel.

Regular airplane mail service is announced to begin this week between Cleveland and Chicago, a distance of about 350 miles. Airplanes are to start from each city at 9:30 a. m., and will be scheduled to arrive at destination at 2 p. m. The post office department plans to transfer mails to and from railroad mail cars at Cleveland, so as to give the benefit of the quick time to letters from Chicago to New York, Boston and other eastern cities, and vice versa.

The Canadian Pacific Railway has applied to the Canadian Government for authority to operate airplanes between such points as may be found desirable. An officer of the road is quoted as saying that no immediate action is contemplated, the company simply means to be prepared for future developments. In speaking of the prospective importance of aerial transportation he called attention to the fact that there is a regular daily airplane service between London and Paris, by a Handley-Page machine which can carry 17 passengers. He said that the estimates of the British Government for the coming year include for air service no less than three hundred million dollars, of which ten million will be set aside for experimental research and civic aviation.

Cleveland, Ohio, by action of its city government, has ordered clocks to be changed from Eastern to Central Standard Time. Using Eastern or 75th Meridian time, as has been done in the winter, Cleveland keeps its clocks about 27 minutes faster than local time; and now, with the daylight saving law in operation, these timepieces are 87 minutes too fast; and this evidently causes the people to rise in the morning earlier than is agreeable to them. The railroads, being required to regulate their time according to the law, as prescribed by Congress through the Interstate Commerce Commission, continue to use Eastern time, with the exception of the Cleveland, Cincinnati, Chicago & St. Louis, which uses Central time. The interurban electric roads have changed from Eastern to Central Standard.

The St. Louis & Hannibal Railroad Company has made application for permission to cease operation and junk its entire property. The petition prepared to this end declares that the road was started toward bankruptcy by the inconsistent orders of the government railway management. (This road is not operated by the government.) From January 1, 1918, to March 31, 1919, the operation of the road resulted in a net loss of $26,620. The petition declares the company is facing certain bankruptcy and asks that it be permitted to cease operation, take up the track and sell the equipment. The original cost of property is given as $1,118,894. It was sold at a trustee sale in 1917 for $620,000. This is a single track railroad, 86 miles in length, extending from Hannibal, Mo., south by east, to Gilmore, where it connects with the Wabash, which makes a connection to St. Louis, 42 miles east.

The Victory Loan Subscriptions of the railway supply industry in Chicago amounted to $5,500,000. The railway supply trade went "over the top" in splendid fashion, oversubscribing its quota by a round million. This record was made by Committee Number 26, Railway Supplies. C. K. Knickerbocker, of the Griffin Wheel Company, was chairman, with T. W. Aishton, of the National Malleable Castings Company; Robert F. Carr, of the Dearborn Chemical Company; L. B. Sherman, of the *Railway Age;* Herbert W. Wolf, of the American Car & Foundry Company; Thomas Finnigan, American Brake Shoe & Foundry Company; R. H. Ripley, American Steel Foundries Company; H. L. Monroe, General Electric Company; James M. Hopkins, the Camel Company, and Frederick T. Vaux, of Adams & Westlake. C. S. Boggs, of Halsey, Stuart & Company, was captain.

The airplane mail service between New York and Washington has now been in operation one year, and the event was celebrated in Washington on Thursday, May 15. The airline distance between New York and Washington is calculated at 218 miles, and the trips have been made with a high percentage of punctuality, one trip each way each day except Sunday. One of the fliers, making 191 flights, made only seven forced landings and failed to complete his trip only five times. Another, making 138 flights, completed 129 of them without landing. There were 10 or more fliers in all, and others made equally good records. The aggregate mileage flown was 128,037 miles; aggregate weight of mail 193,021 lb. The same six airplanes that began the service are still in operation, with the same engines. It is stated that there has been but one serious injury to a machine, and but one serious accident to a pilot.

According to a statement isued by Otto Praeger, second assistant Postmaster General, the sale of airplane mail stamps has amounted to $159,700. He says that there was a saving in railroad mail transportation of $2,264, and that the airplane operating expenses amounted to $142,861.

Change in M. C. B. Rules

The American Railroad Association, Mechanical Section, has issued Circular 37, reestablishing delivering lines' responsibility and the use of defect cards between railroads under federal control, all circulars and interpretations to the contrary being abrogated. In view of accounting division Circular 86, articles 1, 2, 3 and 4 of the 1918 code of the Master Car Builders' rules for freight cars and modifications A to C inclusive of the 1918 code for passenger cars have been withdrawn and new rules have been formulated to govern the inspection and intrechange of cars between roads under federal control.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH, 1919

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	141	$152,623	$51,412	$215,778	$42,465	$58,645	$2,404	$91,866	$8,940	$205,257	95.12	$10,521	$11,216	—$699	—$46,886
Alabama Great Southern	512	571,347	191,277	810,894	117,803	251,285	12,534	326,084	16,405	737,152	90.91	73,741	24,561	49,160	—153,438
Ann Arbor	301	242,324	55,371	316,167	65,701	49,772	2,290	155,873	11,804	285,443	90.28	30,724	16,701	13,960	—27,518
Arizona Eastern	377	241,042	46,466	304,444	84,385	46,585	1,426	103,376	3,059	241,734	79.40	62,710	16,282	46,455	—95,665
Atchison, Topeka & Santa Fe	8,635	8,612,749	3,277,494	12,494,210	1,991,515	3,189,537	144,125	5,118,204	254,531	10,661,619	85.83	1,832,591	553,339	1,277,353	—2,161,118
Atlanta & West Point	93	105,588	107,382	239,350	26,285	40,091	2,725	75,568	5,833	151,708	63.38	87,642	8,500	79,140	30,909
Atlanta, Birmingham & Atlantic	639	329,464	72,857	428,661	125,372	126,049	6,876	239,901	11,418	509,705	118.90	—81,045	16,000	—97,4-0	—101,890
Atlantic City	177	122,125	128,160	263,830	43,212	37,381	1,815	165,361	854	248,708	94.27	15,122	12,000	3,122	—22,498
Atlantic Coast Line	4,839	3,585,574	1,878,891	5,801,391	791,633	1,255,556	64,952	2,767,289	113,726	5,036,242	86.81	765,149	210,000	553,385	—904,488
Baltimore & Ohio	5,145	8,838,210	2,463,386	12,336,137	2,206,307	4,484,158	147,659	6,044,768	385,050	13,363,526	108.33	—1,027,389	346,355	—1,374,434	—2,052,854
Baltimore & Ohio Chicago Terminal	91	.....	—4	120,486	19,411	43,923	1,056	117,313	7,613	193,991	161.00	—73,505	26,542	100,052	—43,059
Baltimore, Chesapeake & Atlantic	87	63,500	29,465	97,218	16,020	18,582	961	62,841	3,799	102,204	105.12	—4,986	3,160	—8,146	25,428
Bangor & Aroostook	632	366,473	77,014	460,175	86,893	115,139	4,634	181,654	12,773	404,949	87.99	55,227	21,000	33,990	—71,903
Beaumont, Sour Lake & Western	118	45,425	21,984	71,723	22,009	19,955	1,298	52,341	4,554	100.157	139.64	—28,435	2,700	—31,142	—92,601
Belt Ry. Co. of Chicago	31	.....	.....	229,014	—8,570	57,127	79	175,240	6,914	230,788	100.77	—1,774	13,969	—15,742	—75,713
Bessemer & Lake Erie	217	609,450	35,486	662,122	99,449	316,066	10,737	274,969	19,354	708,029	106.93	—45,907	14,500	—60,409	—37,835
Bingham & Garfield	36	75,735	2,523	81,592	32,375	40,110	1,219	28,615	3,854	106.609	130.66	—25,017	6,232	—31,248	—143,844
Birmingham Southern	29	39,650	.....	54,219	3,369	9,441	717	22,956	3,925	39,778	73.36	14,440	2,616	11,112	5,984
Boston & Maine	2,258	2,782,437	1,588,859	4,927,007	664,962	1,152,769	42,966	2,917,210	171,411	4,975,607	100.98	—48,599	173,318	—221,962	—489,095
Buffalo & Susquehanna	296	147,931	7,855	159,402	35,334	92,601	1,850	61,377	6,990	198,152	124.30	—38,750	3,250	—41,999	—53,375
Buffalo, Rochester & Pitts	589	933,523	122,175	1,090,230	197,483	290,096	14,684	555,154	34,300	1,093,527	100.30	—3,297	27,000	—30,439	—198,068
Canadian Pacific Lines in Maine	233	215,904	97,172	326,875	20,856	89,234	2,495	215,061	3,537	331,184	101.31	—4,308	11,000	—15,308	28,626
Carolina, Clinchfield & Ohio	282	403,555	32,336	441,948	82,506	111,319	3,613	135,946	13,592	346,963	78.50	94,985	16,300	78,685	—17,479
Central of Georgia	1,918	1,060,403	499,856	1,738,688	371,763	402,865	48,749	769,355	56,539	1,646,609	94.70	92,078	64,042	27,655	—498,450
Central of New Jersey	684	2,202,370	607,190	3,077,687	461,167	867,303	19,193	1,654,066	81,225	3,101,079	100.76	—23,392	157,074	—180,465	—566,148
Central of New England	301	385,672	28,850	433,888	120,993	107,432	2,963	264,272	14,819	511,483	117.88	—77,595	16,000	—93,686	—181,460
Central Vermont	411	277,325	80,694	397,772	53,271	117,096	5,979	268,166	17,577	462.790	116.35	—65,018	17,460	—82,422	—79,202
Charleston & Western Carolina	342	200,821	57,616	268,434	54,068	39,390	6,412	127,079	4,569	231,519	86.24	36,915	8,500	29,415	—45,905
Chesapeake & Ohio	2,506	3,840,338	1,253,688	5,271,819	902,940	1,189,027	36,500	2,212,178	119,295	4,491,415	85.19	780,405	172,000	608,237	—712,671
Chicago & Alton	1,050	1,310,773	476,560	1,899,167	322,224	513,303	27,802	895,779	48,884	1,817,696	95.71	81,471	60,206	21,133	—336,795
Chicago & Eastern Illinois	1,131	1,278,331	398,126	1,806,857	326,640	820,186	24,065	851,095	47,690	2,076,696	114.93	—269,839	79,500	—349,898	—632,635
Chicago & Erie	269	656,248	82,434	807,993	65,577	136,212	11,182	485,223	27,996	730,875	90.45	77,118	27,678	49,421	—44,079
Chicago & North Western	8,090	6,657,446	2,565,566	10,034,661	1,165,833	2,200,121	88,133	5,151,775	244,282	8,928,367	88.97	1,106,294	475,000	630,792	—972,422
Chicago, Burlington & Quincy	9,372	7,885,183	2,553,813	11,279,417	1,672,211	2,531,872	95,932	4,764,839	318,194	9,492,052	84.15	1,787,364	314,000	1,466,291	965,016
Chicago Great Western	1,496	1,011,644	452,263	1,579,748	218,805	310,605	28,259	792,235	43,419	1,405,071	88.94	174,678	54,975	120,140	—224,356
Chesapeake & Ohio	2,506	3,840,338	1,253,689	5,271,819	902,940	1,189,026	36,500	2,212,178	119,295	4,491,415	75.19	780,405	172,000	608,237	—712,671
Chicago, Indianapolis & Louisville	657	556,612	219,648	851,988	91,450	223,316	13,103	366,547	26,166	730,437	85.73	121,552	32,501	89,050	—64,701
Chicago Junction	12	.....	.....	257,250	89,288	66,198	85	227,906	6,912	390,388	151.75	—133,138	2,401	—135,540	—160,212
Chicago, Milwaukee & St. Paul	10,273	7,655,699	2,373,701	10,970,124	916,756	3,805,500	92,98.	5,437,785	341,368	10,622,117	96.82	348 006	481,881	—137,929	—1,562,725
Chicago, Peoria & St. Louis	247	88,183	26,178	121,843	43,584	69,147	2,406	82,339	9,754	207,228	170.00	—85,385	7,400	—92.785	—95,890
Chicago, Rock Island & Gulf	474	271,544	70,868	360,522	63,489	67,609	7,653	172,688	11,350	323,287	89.67	37,246	13,155	24 057	—82,726
Chicago, Rock Island & Pacific	7,723	5,347,952	2,269,122	8,103,326	1,396,900	2,043,177	97,880	3,566,138	201,627	7,329,308	90.44	774,018	348,264	425,031	—1,304,082
Chicago, St. Paul, Minn. & Omaha	1,749	1,360,771	600,297	2,096,472	176,491	446,137	14,366	1,109,459	59,957	1,822,090	86.91	274,382	104.241	169,898	—185,325
Chicago, Terre Haute & S. E	374	300,549	22,620	330,775	51,003	142,291	4,339	119,729	6,975	325,782	98.49	4,993	14.500	—9,507	—32,078
Cincinnati, Indianapolis & Western	657	1,556,612	219,648	851,989	91,451	223,317	13,103	366,547	26,167	730,436	85.73	121,552	32,501	89,050	—64,701
Cincinnati, New Orleans & Texas Pacific	337	978,331	285,139	1,330,639	139,239	517,354	22,351	474,209	31,379	1,196,924	89.95	133,715	39,000	94,711	—147,351
Cincinnati Northern	251	201,266	18,604	224,861	40,684	49,187	2,622	77,155	4,070	173,718	77.25	51,143	8,500	42.640	8,835
Cleveland, Cincinnati, Chic. & St. Louis	2,395	3,536,650	1,192,953	5,126,885	666,087	1,070,443	82,619	2,173,181	102,453	4,132,123	80.59	994,763	185,000	809,146	—748,879
Colorado & Southern	1,100	829,458	165,031	1,053,027	145,283	258,873	9,973	400,178	36,679	856,095	81.29	196,933	47,000	149,052	—43,743
Colorado & Wyoming	41	24,905	1,238	93,939	9,526	18,983	75	47,642	3,682	79,909	85.06	14,031	4,000	10.031	—14,619
Cumberland Valley	163	323,767	67,596	432,194	66,923	94,116	5,904	179,763	14,196	361,540	83.65	70,654	9 164	61,490	—55,209
Delaware & Hudson Co	868	2,332,170	246.353	2,698,013	347,676	807,574	18,672	1,131,133	102,627	2,451,158	90.85	246.855	60,000	186,757	355,501
Delaware, Lackawanna & Western	955	3,764,159	898,849	5,275,652	522,678	1,151,068	24,404	2,487,308	114,915	4,356,839	82.59	918 813	340,956	577.473	—317,751
Denver & Rio Grande	2,643	1,674,535	424,325	2,232,121	274,794	750,847	22,220	892,627	69,118	2,045,305	91.63	186,816	100,000	86,085	—490,109
Denver & Salt Lake	255	138,568	24,025	169,196	48,315	96,084	921	131,254	4,112	280,686	165.89	—111,490	9.000	—120,491	—78 833
Detroit & Mackinac	381	103,551	28,542	139,267	18,770	36,935	7,978	64,283	19,874	147,840	106.16	—8,573	2,378	—10,951	—30,839
Detroit, Toledo & Ironton	457	240,118	13,154	268,146	72,372	112,521	3,345	139,102	12,270	339,610	126.65	—71,465	8,500	—79,965	—31,546
Detroit & Toledo Shore Line	61	212,059	.....	215,282	12,863	15,114	347	55.543	3,056	86,923	40.38	128.360	21,996	106,357	18,207
Duluth & Iron Range	292	111,594	25,973	151,206	55,331	87,445	600	118,081	13,313	274,769	181.71	—123,563	7,630	—131,398	15,849
Duluth, Missabe & Northern	410	146,560	44,030	212,618	63,181	117,365	2,166	138,722	7,896	330,602	155.49	—117,984	10,012	—127,996	156,373
Wichita Falls & N. W	328	100,456	34,778	141,882	44,575	24,475	760	74,660	7,633	152,102	107.20	—10,219	9,256	—19.535	6,476
Philadelphia, Bethlehem & N. E	71	.....	.....	64,284	5,834	9,816	333	43,926	1,701	61,611	95.84	2,672	1,100	1,572	—10,261
Cincinnati, Lebanon & Northern	76	49,172	5,729	68,678	13,763	18,187	1,163	55,313	803	89,228	129.92	—20,550	4.441	—24,991	—26,397
Duluth, South Shore & Atlantic	599	219,473	83,699	322,106	54,927	62,957	6,193	184,118	8 842	321,531	99.82	576	19.000	—18,446	—14,903
Duluth, Winnipeg & Pacific	178	162,635	28,198	203,598	18,298	30,673	1,748	90,133	8,706	158,279	77.74	45,319	10,506	34,813	8,497
East St. Louis Connecting	3	.....	.....	76,914	10,647	37,759	261	54,037	2,984	105,688	137.41	—28,774	5.111	—33,884	30,580
El Paso & Southwestern Co	1,027	808,009	180,339	1,036,795	130.515	207.200	9,918	293,428	24,831	672,594	64.87	364,201	48,364	315 837	—208,927
Elgin, Joliet & Eastern	828	1,575,690	2	1,838,780	166,643	429,138	7,337	699,366	24,437	1,326,878	72.16	511,902	53,250	458,652	59,994
Erie	1,989	4,753,383	1,017,652	6,439,134	890,162	2,158.223	62,046	3,768,954	208,447	7,127,749	110.69	—688,616	267,475	—959,282	—677,196
Florida East Coast	764	468,073	428,865	990,132	147,271	179,387	7,374	502,662	17,902	865,340	87.39	124,792	38,784	86,008	—417,972
Ft. Smith & Western	253	89,827	23,586	122,243	23,919	29,204	3,758	45,722	6,408	109,239	89.36	13,004	5,000	8,004	—5,425

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH, 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Ft. Worth & Denver City	454	$573,354	$217,338	$819,964	$98,934	$161,477	$7,539	$334,542	$30,040	$635,016	77.44	$189,948	$19,250	$165,645	—$34,150
Ft. Worth & Rio Grande	235	70,130	47,899	126,163	35,022	38,055	2,687	75,198	14,703	165,664	131.30	—39,502	2,983	—42,485	—49,056
Fonda, Johnstown & Gloversville R. R.	88	20,729	63,321	87,494	9,397	8,895	620	40,695	-4,601	64,216	73.39	23,278	4,900	18,378	—12,795
Galveston, Harrisburg & San Antonio	1,382	1,038,773	460,237	1,581,654	253,873	269,971	14,727	612,036	50,031	1,315,983	83.20	265,672	52,205	212,828	—110,017
Galveston Wharf	13	.....	.....	57,001	19,085	888	938	19,939	2,192	48,643	85.33	8,358	11,400	—3,041	—29,179
Georgia	328	370,627	147,984	556,565	61,069	86,633	5,591	241,041	16,078	410,569	73.76	145,996	5,590	140,041	10,111
Georgia, Southern Florida	402	236,131	101,782	370,452	66,483	81,992	5,599	184,186	9,705	349,790	94.42	20,662	13,550	7,037	—37,545
Grand Rapids & Indiana	569	388,026	142,239	584,198	93,083	120,008	10,496	325,776	22,436	572,774	98.04	11,424	25,951	—14,536	—91,025
Grand Trunk Western	1,001	1,328,989	253,323	1,703,671	169,945	308,886	13,374	828,111	45,036	1,364,004	80.06	339,668	49,390	289,021	329,141
Great Northern	8,252	5,308,201	1,421,562	7,411,951	1,322,174	1,720,275	65,350	3,511,086	161,817	6,860,781	92.56	551,170	251,946	298,867	—223,103
Gulf & Ship Island	307	138,355	42,363	195,247	59,051	45,837	4,199	76,694	8,221	194,359	99.54	887	11,355	—10,487	—65,616
Gulf, Colorado & Santa Fe	1,937	942,623	381,903	1,404,707	326,816	279,409	10,558	629,197	47,316	1,291,076	91.91	113,632	71,167	42,084	—412,962
Gulf, Mobile & Northern	424	144,765	41,583	198,481	39,369	61,162	5,046	99,511	9,857	214,951	108.30	—16,470	10,546	—27,049	—63,942
Hocking Valley	350	379,904	86,120	500,190	89,210	226,484	5,516	234,281	19,840	575,253	115.00	—75,062	57,067	—132,129	—230,758
Houston, East & West Texas	190	131,392	43,956	183,664	34,597	24,928	749	81,652	4,159	146,085	79.53	37,579	6,158	31,369	2,008
Houston & Texas Central	856	434,973	184,842	656,096	145,375	150,394	5,961	321,725	20,270	643,678	98.11	12,418	34,023	—21,830	—187,928
Illinois Central	4,782	5,830,579	1,922,329	8,327,859	1,558,063	2,295,010	78,423	3,445,966	229,066	7,628,323	91.60	699,536	403,500	292,316	—1,926,432
Indiana Harbor Belt	116	.....	.....	468,192	85,938	119,860	1,667	312,811	16,808	537,084	114.71	—68,892	9,954	—78,846	—140,463
International & Great Northern	1,159	722,327	235,821	1,033,188	299,506	361,784	12,438	595,860	43,162	1,317,571	127.52	—284,384	30,000	—314,386	—576,751
Kanawha & Michigan	176	193,624	51,542	255,326	39,459	104,675	2,473	106,167	12,039	264,812	103.71	—9,487	17,885	—27,372	—90,581
Kansas City, Mexico & Orient	272	75,340	13,685	92,948	42,849	40,170	2,084	53,839	6,857	145,798	156.85	—52,850	6,250	—59,100	—27,634
Kansas City, Mexico & Orient of Texas	465	78,361	11,349	94,933	34,574	40,785	1,712	52,965	8,007	138,043	145.41	—43,110	5,000	—48,112	—40,118
Kansas City Southern	774	852,890	175,654	1,112,776	209,858	322,580	19,687	469,586	43,419	1,066,643	95.32	52,134	61,250	—9,744	—383,393
Kansas City Terminal Co	27	.....	.....	104,555	14,501	26,111	.....	47,767	1,213	90,972	87.01	13,583	20,150	—6,567	—6,914
Lake Erie & Western	902	683,935	63,146	775,356	123,332	257,296	10,649	321,944	23,088	736,156	94.94	39,199	27,000	12,060	—186,288
Lehigh & Hudson River	96	172,052	3,916	184,451	22,927	59,233	1,573	87,505	5,239	176,477	95.67	7,974	4,500	3,471	—38,253
Lehigh Valley	1,435	3,384,318	416,380	4,279,673	643,506	1,328,475	42,356	2,095,047	95,158	4,219,734	98.59	59,940	146,725	—86,815	—681,467
Long Island	398	386,484	1,116,733	1,672,794	272,486	272,931	9,464	934,974	47,780	1,553,365	92.86	119,429	85,804	32,998	—169,544
Los Angeles & Salt Lake	1,168	1,005,693	341,764	1,431,075	271,750	301,482	17,745	467,002	30,623	1,117,458	78.08	313,617	67,235	246,278	16,547
Louisiana & Arkansas	302	128,075	33,560	170,038	46,825	45,657	2,676	87,564	5,680	188,403	110.80	—18,365	11,755	—30,120	—74,611
Louisiana Western	207	162,101	124,735	301,711	38,243	54,874	2,875	80,851	10,597	189,538	62.82	112,173	9,070	103,080	—33,604
Louisville & Nashville	5,013	6,272,994	2,105,483	8,794,552	1,393,715	2,105,419	109,638	3,555,209	189,210	7,384,049	83.96	1,410,502	246,773	1,162,974	—952,080
Louisville, Henderson & St. Louis	199	159,581	58,732	227,728	46,918	29,596	7,010	90,080	6,924	180,527	79.27	47,201	4,000	43,189	—26,599
Maine Central	1,216	874,457	366,184	1,338,677	202,956	332,431	11,304	879,681	37,524	1,464,352	109.38	—125,674	75,623	—201,303	—178,674
Maryland, Delaware & Virginia Ry. Co.	82	58,644	26,237	87,312	10,182	17,826	355	61,882	2,357	92,603	106.05	—5,290	1,733	—7,023	16,840
Michigan Central	1,861	3,818,645	1,346,295	5,633,810	894,697	1,208,786	72,873	2,275,426	104,537	4,624,884	82.09	1,008,925	160,000	848,716	—809,878
Mineral Range	101	71,269	380	73,721	7,959	18,420	313	43,447	907	71,074	96.40	2,647	3,300	—653	178
Minneapolis & St. Louis	1,646	731,897	229,037	1,011,633	177,588	259,279	6,763	515,905	29,217	984,586	97.32	27,047	46,763	—20,084	—134,199
Minn. & International Ry. Co	194	72,728	25,589	102,954	20,030	17,555	533	52,716	3,635	94,470	91.75	8,484	5,133	3,351	—26,320
Minn., St. Paul & Sault Ste. Marie	4,243	2,253,220	592,228	3,033,582	401,955	766,384	23,696	1,345,733	71,812	2,826,022	93.15	207,561	187,693	19,463	—333,398
Missouri & North Arkansas	365	86,685	34,970	128,620	64,687	44,987	1,157	56,357	8,285	175,364	136.34	—46,744	7,178	—54,194	—62,350
Missouri, Kansas & Texas	1,714	1,743,632	658,782	2,539,440	603,776	828,528	15,342	852,999	78,044	2,384,168	93.88	155,272	90,355	64,850	—474,730
Missouri, Kansas & Texas of Texas	1,796	1,080,940	628,840	1,830,847	448,076	334,230	14,271	956,148	65,082	1,835,499	100.25	—3,652	47,828	—52,325	—155,341
Missouri, Oklahoma & Gulf	332	82,185	17,399	104,929	55,235	48,234	1,708	57,470	6,501	169,266	161.31	—64,337	8,500	—72,851	—66,747
Missouri Pacific	7,108	4,701,371	1,570,301	6,737,364	1,459,390	1,756,726	61,683	3,049,528	199,184	6,555,190	97.29	182,174	258,287	—78,474	—1,906,256
Mobile & Ohio	997	934,656	170,468	1,168,163	203,114	478,163	15,606	596,120	35,214	1,327,999	113.68	—159,836	55,174	—215,421	—271,559
Monongahela Connecting	6	.....	.....	173,328	23,412	62,209	511	82,536	7,160	175,828	101.44	—2,500	2,539	—5,039	—47,202
Monongahela R. R.	108	232,389	21,716	258,313	60,661	41,416	1,193	75,540	6,550	185,360	71.75	72,953	5,000	67,953	16,354
Montour R. R.	54	59,028	1,864	64,696	20,162	28,386	1,052	23,088	6,155	78,911	121.97	—14,215	2,286	—16,501	7,611
Morgan's Louisiana & Texas R. R.	400	329,087	195,569	554,819	89,767	132,597	7,094	248,375	20,249	500,266	90.16	54,553	31,034	23,381	—253,949
Nashville, Chattanooga & St. Louis	1,247	1,001,216	436,298	1,533,492	354,582	453,020	32,413	707,449	43,024	1,600,611	104.37	—67,119	50,000	—117,172	—547,505
Nevada Northern	168	96,256	9,240	114,084	14,976	18,923	830	39,019	4,431	78,298	68.63	35,787	18,323	17,464	—75,245
Northern Alabama	112	82,242	13,826	98,383	24,618	6,254	1,362	67,861	1,892	101,988	103.66	—3,605	3,400	—7,005	41,406
Newburgh & South Shore R. R.	7	.....	.....	144,756	17,577	25,633	.....	59,416	3,563	106,189	73.36	38,567	8,198	30,368	32,052
New Orleans & N. E.	498	340,237	126,947	521,379	57,845	126,829	8,036	283,225	14,787	501,039	96.10	20,340	28,357	—8,048	—188,668
New Orleans Great Northern	284	134,066	42,554	183,608	42,319	40,996	3,176	84,096	8,939	180,063	98.06	3,545	9,100	—5,721	—53,968
Mississippi Central	164	60,216	27,631	91,713	17,441	31,663	1,448	33,039	5,490	89,081	97.13	2,632	3,325	—693	—29,189
Grand Trunk Lines in New England	172	285,229	36,227	371,448	102,362	44,768	3,099	202,669	11,603	393,919	106.04	—22,471	11,500	—33,971	—33,025
New Orleans, Texas & Mexico	191	118,699	34,063	164,267	36,735	42,738	2,793	38,489	5,501	128,140	78.00	36,127	10,000	26,127	—83,842
New York Central	6,075	14,025,568	6,722,044	23,430,720	3,023,034	5,511,401	155,901	11,298,167	635,921	20,997,452	89.61	2,433,268	1,017,123	1,414,360	—2,570,718
New York, Chicago & St. Louis	572	1,874,009	119,182	2,035,861	258,667	360,733	23,343	785,270	52,810	1,483,582	72.87	552,279	55,000	496,919	145,881
New York, New Haven & Hartford	1,965	3,327,628	3,411,471	7,652,328	918,119	1,696,858	45,068	4,183,056	277,418	7,297,317	95.36	355,012	268,000	86,231	—1,067,259
New York, Ontario & Western	569	361,506	92,162	577,585	96,029	197,551	10,006	327,688	24,987	656,261	113.62	—28,676	24,700	—103,376	—199,382
New York, Philadelphia & Norfolk	121	451,575	128,204	622,176	52,753	114,553	7,385	306,495	11,038	509,544	81.89	112,632	17,035	95,597	42,263
New York, Susquehanna & Western	135	167,824	57,782	270,607	43,515	54,924	1,668	193,965	8,819	303,134	112.02	—32,527	37,111	—69,639	—103,804
Norfolk & Western	2,088	4,833,378	787,917	5,844,392	772,006	1,623,566	33,695	2,153,693	108,321	4,710,856	80.60	1,133,536	260,000	873,401	—320,500
Norfolk Southern	907	392,860	135,907	566,258	125,524	106,332	7,208	262,971	18,058	520,311	91.88	45,947	19,882	26,008	—83,300
Northern Pacific	6,564	5,568,590	1,484,313	7,423,001	1,131,792	1,506,915	58,799	3,006,185	190,193	1,932,419	79.92	1,490,582	520,026	968,513	—1,246,335
Northwestern Pacific	507	187,233	153,678	382,433	119,894	72,032	5,231	198,099	11,615	408,230	106.74	—25,797	22,019	—47,871	—135,806
Oregon Short Line	2,347	2,082,845	556,302	2,822,116	610,711	539,239	20,692	892,188	79,357	2,196,545	77.83	625,571	177,964	447,461	—428,913

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MARCH, 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Oregon-Washington R. R. & Nav. Co...	2,060	$1,541,116	$593,224	$2,344,946	$506,806	$377,258	$29,411	$997,326	$94,267	$2,048,286	87.34	$296,660	$113,614	$182,909	—$220,407
Panhandle & Santa Fe	772	272,531	73,875	372,125	122,935	137,595	3,124	205,245	14,717	482,493	129.65	—110,368	15,924	—126,446	—251,294
Pennsylvania Co.	1,754	4,887,542	1,589,526	7,180,289	1,004,081	1,997,278	61,395	3,490,512	186,452	6,769,312	94.27	410,978	289,573	930,615	—685 970
Pennsylvania Railroad	5,360	17,430,540	7,779,810	27,514,360	3,958,012	7,235.655	220,972	15,034,164	719,857	25,721,373	93.48	1,792,988	861,238	930,615	685,970
Peoria & Pekin Union	19	29,542	5,504	96,510	18,309	33,869	885	76,202	5,764	135,029	139.91	—38,519	9,500	—48,019	—51,374
Pere Marquette	2,232	1,989,579	405,591	2,581,811	337,219	550,381	21,640	1,101,401	72,890	2,085,459	80.77	496,352	104,447	391,794	—160.664
Philadelphia & Reading	1,127	3,421,559	817,753	4,539,028	559,805	1,755,895	40,554	3,015,782	127,668	5,512,851	121.45	—973,822	143,228	—1,116,997	—2,262,666
Pittsburgh & Lake Erie	224	2,058,770	197,736	2,413,921	564,074	705,578	21,174	981,945	43,133	2,317,158	95.99	96,763	75,500	21,263	—684,428
Pittsburgh & Shawmut	103	61,075	4,607	66,789	37,735	35,817	1,310	29,293	3,244	107,398	160.80	—40,610	971	—41,581	—60,454
Pittsburgh & West Virginia	63	79,254	10,046	100,369	52,113	32,836	1,194	51,188	5,313	150,964	150.40	—50,595	11,261	—61,856	—79,053
Pittsburgh, Cincinnati, Chic. & St. Louis	2,383	4,512,833	1,535,590	6,920,967	853,302	2,068,832	80,803	3,458,171	175,297	6,700,982	96.82	219,986	233,118	—13,271	—1,095,605
Pittsburgh, Shawmut & Northern	204	64,102	6,725	73,979	18,922	34,973	927	34,335	5,360	94,522	127.76	—20,543	1,844	—22,405	8,071
Port Reading	21	84,528	.....	119,347	—6,821	4,576	18	81,821	1,418	81,010	67.87	38,337	9,000	29,337	—54,073
Richmond, Fred. & Pot	77	363,896	241,581	662,499	76,062	88,517	4,038	221,517	13,790	413,649	62.43	248,850	11,809	237,000	96,387
Rutland	415	199,903	105,056	359,490	64,156	93,347	9,273	167,566	10,948	345,293	96.05	14,198	19,059	—4,866	—22,035
St. Joseph & Grand Island	258	138.024	39,611	189,921	40,393	41,979	1,661	147,492	12,664	246,014	129.53	—56,093	8,810	—64,967	—109,818
St. Louis, Brownsville & Mexico	548	256,339	129,211	402,471	62,581	73,701	3,894	120,193	15,317	275,686	68.49	126,784	10,000	116,782	13,549
St. Louis Merchants Bridge Terminal	9	.....	820	193,439	63,514	64,686	719	162,392	7,286	298,597	154.36	—105,158	8,000	—113,158	—127,675
St. Louis-San Francisco	4,761	3,932,296	1,675,460	5,913,473	1,030,337	1,329,999	58,492	2,399,468	160,383	4,970,686	84.06	942,787	215,936	724,545	—213,448
St. Louis, San Francisco & Texas	134	94.523	4,827	105,808	20,890	24,006	2,924	62,676	4,072	114,569	108.28	—8,760	1,629	—10,421	—44,663
St. Louis Southwestern	93	836,019	159,604	1,038,896	281,607	279,029	16,514	368,860	38,068	996,935	95.96	41,961	37,140	4,774	—569,139
St. Louis Southwestern of Texas	814	315,560	103,972	455,879	141,128	196,633	6,810	240,939	22,786	604,444	132.58	—148,566	21,000	—169,634	—194,372
San Antonio & Aransas Pass	732	176,907	81,648	779,419	100,033	109,419	5,716	161,334	15,954	391,483	140.11	—112,063	15,000	—127,071	—160,202
Seaboard Air Line	3,563	2,150,261	1,186,085	3,698,777	536,726	823,535	59,464	1,731,737	100,208	3,281,099	88.70	417,678	135,000	281,824	—366,800
South Buffalo Ry. Co.	11	36,948	.....	77,477	13,032	17,013	279	53,285	1,680	85,288	110.09	—7,811	2,551	—10,361	—60,769
Southern R. R.	6 982	5,782,641	2,947,971	9,469,761	1,600,662	2,498,476	132,653	4,403,705	284,271	8,964,911	94.66	504,850	322,231	174,512	—2,997,116
Southern in Mississippi	278	70,467	45,840	123.307	43,082	26,197	2,234	68,743	4,639	144,892	117.51	—21,585	9.000	—30,587	—42,807
Southern Pacific	7,049	8,189,384	3,324,755	12,470,349	2,555,222	3,087,379	120,413	5,045,571	287,551	11,338,870	90.93	1,131,479	601,881	525,087	—1,462,163
Spokane International Ry. Co.	156	50,270	14,794	67,390	13,715	7,437	1,770	28,269	4,203	55,394	82.19	11,996	4,013	7,983	—15,813
Spokane, Portland & Seattle	554	432,247	129,545	596,296	120,939	90,806	5,747	262,036	19,964	438,538	73.54	157,758	59,200	98,523	—71,432
Staten Island Rapid Transit Co.	23	60,591	69,401	143,356	26,645	26,923	846	93,767	9,149	157,330	109.75	—13,974	9,000	—22,980	2,018
Tennessee Central	293	174,314	43,210	229,174	99,414	42,010	2,307	114,999	6,154	264,883	115.58	—35,709	5,135	—40,844	—57,741
Terminal R. R. Assn. of St. Louis	36	.....	3,108	296,028	72,490	81,501	723	140,443	6,533	305,042	103.04	—9,014	28,250	—37,264	—89,539
Texarkana & Ft. Smith	81	80,204	17,220	106,395	22,669	18,007	1,698	54,710	2,904	95,968	90.19	10,427	6,459	3,968	—40,857
Texas & New Orleans	469	431,814	169,724	637,250	124,855	193,686	4,824	251,076	13,946	602,648	94.57	34,602	21,086	13,374	—145,727
Texas & Pacific	1,946	1,734,935	716,316	2,593,599	529,205	548,084	27,391	1,344,122	75,742	2,544,220	86.13	49,379	84,971	—36,173	—487,574
Toledo & Ohio Central	435	494,310	71,624	588,349	101,864	175,342	6,890	263,044	14,788	564,083	95.87	24,266	32,975	—8,709	—101.267
Toledo, Peoria & Western	247	59,849	50,910	111,751	25,011	38,266	2,115	61,922	6,760	134,072	119.97	—22,321	8,500	—30,821	—28,776
Toledo, St. Louis & Western	454	494,184	29,822	550,144	89,961	130,244	3,982	239,605	13,062	476.853	86.67	73,292	26,000	47,292	—139,075
Trinity & Brazos Valley	368	71,939	18,366	95,411	42,603	43,942	1,566	63,991	5,943	158,043	165.64	—62,631	5,715	—68.353	—42,525
Ulster & Delaware	128	35,845	12,736	63,761	11,614	15,458	1,483	53,674	4,773	87,513	137.25	—23,751	4,600	—28,405	—25,403
Union Pacific	3,614	6,189,112	1,648,255	8,402,369	1,459,964	1,583,099	41,546	2,709,116	228,459	6,196,791	73.75	2,205,578	261,551	1,942,743	—389,566
Union R. R. of Pennsylvania	35	.....	.....	654,189	54,643	121,744	280	353,693	7,296	517,655	79.12	136,533	6,428	130,105	220,297
Utah Ry.	98	88,401	781	90,016	7,210	26,493	187	17,784	2,127	53,799	59.74	36,317	4,091	32,126	—12,591
Quincy, Omaha & Kansas City	255	50,632	26,184	82,248	21,635	11,234	254	32,640	1,973	67,724	82.34	14,523	3,003	11,520	6,365
Vicksburg, Shreveport & Pacific	171	165,485	70,394	252,674	52,050	50,421	3,085	91,052	7,369	206,187	81.60	46,487	9,417	36,985	—32,877
Virginian	518	562,462	52,102	690,849	148,962	206,963	4.495	317,252	14,893	690,025	99.88	823	38.000	—37,180	—183,344
Wabash	2,519	2,629,512	697,381	3,505,276	582,507	728,321	44.439	1,978,403	103,863	3,457,770	98.64	47.507	108,887	—61,588	—803,004
Washington Southern	35	134,575	203,074	382,525	42,502	34,891	2,732	120,628	6,630	211,749	55.35	170.776	6,318	164,451	70,362
West Jersey & Seashore	361	261,900	456,480	774,300	166,832	154,146	6,906	460,542	21,595	815,386	105.31	—41,086	40,063	—81,371	—128,032
Western Maryland	707	864,828	79,987	1,038,406	194,031	388,269	16,649	484,407	39,299	1,133,306	109.14	94,900	43,200	—138,100	—300,304
Western Pacific	1,011	619,459	115,593	762,681	251,460	200,048	10,963	313,232	22,064	814,516	106.79	—51.835	48,232	—100,090	—294,041
Western Ry of Alabama	133	111,921	92,817	224,208	27,556	50,380	2,674	76,913	5,680	166,295	74.16	57,913	7,500	50,413	—7,055
Wheeling & Lake Erie	511	578,091	50,682	696,772	165,642	202,674	6,422	354,460	24,962	756,757	108.60	—59,984	53.500	—113,484	—236,898
Yazoo & Mississippi Valley	1,381	1,367,730	440,067	1,888,063	331,729	441,886	14,870	762,202	49,581	1,504,980	79.71	383,084	68.066	314,864	—309,548
Perkiomen R. R	42	69,012	6,104	78,872	4,640	3,592	17	41,974	254	50,496	64.02	28,376	1,800	26,576	—2,247
St. Louis Transfer Co.	6	.....	.....	55.239	13.450	17,063	178	46,930	2,111	79,731	144.34	—24,493	100	—24,593	—31,565
Southern Pacific Steamship Line	...	780,527	41,420	862,795	14,547	181,093	12,239	617,422	25,742	851,044	98.64	11,751	13,719	—1,968	—137,107
THREE MONTHS OF CALENDAR YEAR 1919															
Alabama & Vicks	141	448,255	175,769	663,958	108,387	172,883	5,343	303,878	24,886	619,092	93.24	44 867	31,839	12,989	—77,416
Alabama Great Southern	312	1,718,286	508.341	2,359,650	262,955	645,464	35,639	1,056,156	50,928	2,069,181	87.69	290,469	73.683	216.735	—200,842
Ann Arbor	301	769,966	154,205	969,924	204,646	165,075	8.164	450,442	36,414	864,845	89.16	105,079	42,900	62,013	61.619
Arizona Eastern	377	799,515	148,323	1,012,212	241,871	153,942	4,154	308,547	9,962	731,967	72.31	280,246	48.846	231,338	—184,519
Atchison, Top. & Santa Fe	8,635	26,367,355	9,974,431	38,091,433	5,528,891	9,129,639	382.514	14,981.820	790.273	30,739,310	80.69	7,352,123	1,653,002	5,694,162	—2,162,941
Atlanta & W. Point	93	336,419	276,720	679,003	79,812	124,155	8,630	247,753	18,987	483,893	71.26	195,111	25.500	169,576	40,956
Atlanta, Birmingham & Atl	639	876,335	212,353	1,168,615	357,026	406,208	19,172	696,506	36,866	1,516.094	129.73	—347,480	48,000	—396,292	—406,571
Atlantic City	177	371,071	342,669	775,290	122,644	118.375	2,410	487,448	2,375	733,510	94.61	41.779	36.000	5,779	69,191
Atlantic Coast Line	4,839	10,555,739	5,067,339	16.648,457	2,336,343	3,327,546	178,886	7,254,547	323,528	13,532,582	81.28	3,115,875	610,000	2,501,697	—1,370,674
Baltimore & Ohio	5,145	26,355,423	7,382,687	36,897,641	6,386,641	13.544,803	445,663	19,279,348	5,202,592	41,138,577	111.49	—4,241,337	1,087,465	—5,333,028	—1,902,712

Strike of Express Company Employees

A strike of wagon drivers and other employees of the American Railway Express Company, in and around New York city, which was settled on Monday of this week, had blockaded the merchandise traffic of the company badly for nearly a week. The men struck for recognition of their newly formed union, and for a further increase in pay, the increase recently granted by the Railroad Administration being declared unsatisfactory; and double-time for Sunday and holiday work, time and one-half for all overtime, and ten holidays a year, were also asked for. Most of the strikers have joined the International Brotherhood of Teamsters; and members of that brotherhood, representatives of the company, and W. S. Carter, representing the Railroad Administration, are to settle the grievances of the men, a large meeting of the strikers having voted unanimously to agree to this. About 10,000 men left their work. Notwithstanding the extent and the completeness of this strike, the delays to traffic which resulted seem to have been much less troublesome than usually is the case in such a condition; the apparent explanation of which is that enormous quantities of merchandise in packages weighing 70 lb. or less were sent by parcel post, while large quantities of other merchandise, which usually go by express, were sent by freight.

Explosion in C. P. R. Tunnel

The five-mile tunnel on the Canadian Pacific near Connaught, B. C., which was being lined by Carter-Halls-Aldinger Company, contractor of Winnipeg, Man., was filled with poisonous gas caused by the explosion of thirty drums of gasoline and kerosene used for the operation of a concrete mixer. A watchman was suffocated in a telephone booth where he had stopped to escape the gas. A slight fire occurred, following the explosion, and the extent of damage was approximately $6,000.

Reorganization of the U. S. Chamber of Commerce

At the recent meeting of the Chamber of Commerce of the United States the delegates approved a recommendation by the board of directors that structural changes be made in the organization of the Chamber to permit an expansion of its activities. The proposed plan contemplates establishment within the chamber of departments designed to deal with the following: Industrial production; domestic distribution; foreign commerce; transportation and communication; finance; insurance; civic development.

Railroad Employees' Subscriptions to Victory Loan

The director general had received to May 13 the following reports regarding the progress of the Victory Loan among the officers and employees of the United States Railroad Administration:

Region—	Employees on roll	Employees Subscribing	Amount Subscribed	Employees Subscribing
Northwestern	248,086	197,493	$19,601,650	79.61
Southern	264,363	117,327	11,385,000	44.38
Southwestern	175,375	104,377	10,614,000	59.5
Pocahontas	50,365	34,406	3,325,450	68.31
Central Western	299,332	244,200	24,456,450	81.
Allegheny	382,484	265,999	21,939,250	69.54
Eastern	419,549	303,372	28,463,500	72.
Pullman lines	21,061	19,917	1,616,350	95.
Coastwise S. S.....	.....	2,226	164,550	.....
N. Y.-N. J. canals....	139	120	12,300	86.
Miss.-Warrior Rivs....	.....	.....	9,600	.....
R. R. Administration (Ship. Board fund).	.....	.....	863,000	.....
Central Administration	1,242	1,242	580,000	100.
Total	.....	.....	$123,031,100	.....

Derailment and Blockade at Sabula, Pa.

By the derailment of a freight train on the Pennsylvania Railroad in a tunnel at Sabula, Pa., on April 30, thirteen freight cars and a large quantity of freight were destroyed, the tunnel for a length of 145 ft. caved in, and the road was blocked so that probably two months will be required for its restoration.

In the train derailed there were 34 loaded and 10 empty cars. A car was derailed in the tunnel, apparently because of the falling of a brake beam, and the train was stopped; fire soon broke out, and nine cars with their contents were entirely destroyed. Most of the rest of the train was considerably damaged. The cause of the fire is not known, but presumably it was started by the ignition of two cars of gasoline which were derailed. The flames were unsubdued for 42 hours and the estimated total damage is $125,000. Sabula is five miles east of Dubois, on the line from Red Bank, Pa., to Driftwood; and all trains are running temporarily over the Buffalo & Susquehanna between Dubois and Driftwood, 45 miles.

Chicago Union Station

Federal government, railroad and city officers of Chicago recently held a conference at which the pushing of the Chicago Union passenger station project was discussed. As a result of this conference it was announced that work on the new station will be rushed and it is expected that more than 3,000 men will be employed on the work within 30 days. The purpose of this conference was to develop cooperation between the city and the railroads and a number of contracts will probably be let in the near future for work on the station and its approaches.

The foundations for the headhouse of the station are at present approximately 50 per cent completed. The Butler Brothers building, which the Union Station Company will have to build in order to get room for tracks, is well under way, the foundation being in and work is now being done on the superstructure for which the John Griffith & Son Company, Chicago, hold the contract. Work is now being done on the substructure of the Harrison street viaduct by the W. J. Newman Company, Chicago, and is approximately 40 per cent completed. The Taylor street viaduct is also approximately 50 per cent completed, the Underground Construction Company having the contract for the substructure and the Strobel Steel Construction Company, Chicago, holding the contract for the superstructure. This part of the work will be finished at an early date. Bids for the twelfth street viaduct are now in the hands of the Chicago Union Station Company and the contracts for this part of the work will be let in the near future. The steel for the Polk street viaduct has been completed and will be on the ground within 30 days. Rails and ties for the tracks from Van Buren to Twelfth street have been bought and it is planned to contract the grading and track work on this approach within ten days. The steel for the raising of the Harrison street bridge has also been delivered and on this the work will be started soon.

Golden Spike Celebration

The fiftieth anniversary of the driving of the golden spike which marked the completion of the first American transcontinental railroad was celebrated at Ogden, Utah, on May 10. Veteran railroad men who were connected with the construction of the Union Pacific or the Central Pacific were in Ogden as guests of the city. There was a great parade, in which was a replica of engine No. 60, the "Jupiter," which was used in the building of the Central Pacific, and George Lashus, of Ogden, who was engineman of the original engine, was at the throttle of the replica, which was mounted on an automobile truck. There were small sized models of the two engines which met at Promontory on May 10, 1869, and which appear in the well-known picture of the driving of the golden spike.

The building of the "Pacific Railroad" was begun at Omaha, Neb., by the Union Pacific and at Sacramento, Cal., by the Central Pacific, in 1863. The race between the two roads to lay the largest mileage of track ended on May 10, 1869, at Promontory, Utah, 50 miles west of Ogden, at which time trains from the Union Pacific and Central (now Southern) Pacific met. Governor Leland Stanford of California, representing the Central Pacific, completed the physical connection of the two roads by driving a golden spike, and T. C. Durant, president of the Union Pacific, took part in the ceremonies. In the last year of the construction work, the two railroads were employing approximately 25,000 men and using 6,000 teams. Many of the men engaged in this work were present at the celebration, and included in these were three

Chinese, each over 90 years old, who began railroad work in California about 1849. These three men, Ging Cui, Wong Fok and Lee Cho, were in the gang that laid the last rail of the Central Pacific up to the point where the golden spike was driven. They came from Susanville, Cal., where they were in the service up to three years ago in gang No. 28.

Reception to Fourteenth Engineers

The Fourteenth Engineers, made up of employees of the principal New England railroads, were guests at a banquet in Boston on Thursday of last week (May 8), which is said to have been the most successful affair of the kind that has been held in any part of New England. The Fourteenth Engineers arrived in Boston on April 27, thirty officers and 1,486 men. Companies A and B were made up of men from the Boston & Maine, C from the Maine Central, D from the Boston & Albany, and companies E and F from the New York, New Haven & Hartford. Prior to the day of the general reception, each road had had an entertainment for companies connected with that road, and the general reception on the 8th filled a whole day, a picnic being held at Riverside, 11 miles from Boston, in the daytime. The banquet in the evening was at Symphony Hall. While the banquet was in progress there was what might be called an overflow meeting, across the street, for the families of the soldiers, a luncheon being served. After the banquet there was a dance.

Robert H. Newcomb, secretary to the federal manager of the Boston & Maine, was chairman of the executive committee which provided these entertainments. This committee represented, not only the railroads and their employees, but also the "Association of Friends of the Fourteenth Engineers."

American Short Line Railroad Association

The American Short Line Railroad Association has issued the call for a meeting at the New Willard Hotel, Washington, on June 3, 4 and 5, which will be attended by five or six hundred representatives of the short line railroads, and also a large number of trunk line executives as guests. The special object to be considered is the legislation necessary to increase and protect transportation facilities. The meeting will be divided into six sessions, each of which will be addressed by a prominent speaker, including Walker D. Hines, director general of railroads, Senators Cummins and Underwood, Representative Esch and possibly Commissioner Hall of the Interstate Commerce Commission.

All short line railroad companies are authorized and requested to send one or more of their officers as delegates, and all such delegates will be urged to participate in the proceedings. The call for the meeting states the object as follows:

"The conditions surrounding the railroads generally, and especially the short lines, are not only serious, but appalling, and Congress must act, and act wisely, to prevent wholesale bankruptcy. While operating the main line railroads, the government has imposed many hardships upon, and in many instances has done great injustice to, the short lines, and it is now a serious question whether it is possible for the Railroad Administration to do adequate justice to such lines. The only real hope is to look to Congress; hence, it is vitally important that all short lines participate in the convention. The legislation to be enacted must be based upon broad, true and equitable principles. It must be fair to the public as well as to the railroads, and to the railroads as well as to the public. It must be such as to enable the main line railroads to become prosperous, otherwise the short lines cannot be, and it must safeguard the rights of the latter class so that they may not be unjustly treated by any interest or community in the future.

"The problem is not sectional, hence, it is most important that the short lines in all sections of the country participate in the plans that are adopted.

"We have invited about 150 of the presidents of the main line companies to attend the convention as our guests, and there is every reason to believe that more than 100 of the leading officials of that class will be present. We think it wise to have these officials present for two reasons: First, the convention must consider the railroad problem as a whole. Second, the short lines must deal with the main lines when they are returned by the government, hence, it will be most desirable to know these officials and take them into consideration."

W. T. Tyler, director of operation of the Railroad Administration, has authorized the issue of necessary transportation for delegates and their families.

Railway Revenues and Expenses for March and Three Months of 1919

The Interstate Commerce Commission's monthly statement of railway revenues and expenses, covering the operations of 183 Class I roads and 17 switching and terminal roads is as follows:

Item	March				Three months ending March 31			
	Amount		Per mile of road operated		Amount		Per mile of road operated	
	1919	1918	1919	1918	1919	1918	1919	1918
1. Average number miles operated	232,815.90	233,310.78	....	....	232,785.76	233,295.88	....	....
REVENUES								
2. Freight	$255,679,065	$259,850,752	$1,098	$1,114	$775,246,187	$646,954,731	$3,330	$2,773
3. Passenger	89,187,627	73,118,329	383	313	255,037,340	201,822,667	1,096	865
4. Mail	4,289,713	4,526,594	19	20	12,798,974	13,481,854	55	58
5. Express	8,158,522	9,574,221	35	41	22,298,936	27,404,486	96	118
6. All other transportation	9,200,325	9,621,329	40	41	27,292,866	25,233,396	117	108
7. Incidental	10,040,344	9,380,223	43	40	31,443,037	25,688,823	135	110
8. Joint facility—Cr.	530,390	431,520	2	2	1,649,777	1,239,992	7	5
9. Joint facility—Dr.	189,477	133,006	1	1	489,646	383,630	2	2
10. Railway operating revenues	376,896,509	366,369,962	1,619	1,570	1,125,277,471	941,442,319	4,834	4,035
EXPENSES								
11. Maintenance of way and structures	59,478,891	43,944,494	256	188	171,787,354	123,728,307	738	530
12. Maintenance of equipment	96,472,547	74,136,684	414	318	285,846,486	207,966,421	1,228	891
13. Traffic	3,693,177	4,533,735	16	19	10,742,931	14,022,473	46	60
14. Transportation	174,338,928	150,544,896	749	645	523,873,397	438,487,543	2,250	1,880
15. Miscellaneous operations	3,743,499	2,940,327	16	13	10,715,171	8,616,652	46	37
16. General	10,299,159	8,584,720	44	37	30,690,985	25,519,908	132	109
17. Transportation for investment—Cr.	653,111	473,734	3	2	1,546,436	1,367,415	6	5
18. Railway operating expenses	347,373,090	284,211,122	1,492	1,218	1,032,109,888	816,973,889	4,434	3,502
19. Net revenue from railway operations	29,523,419	82,158,840	127	352	93,167,583	124,468,430	400	533
20. Railway tax accruals (excluding "War Taxes")	14,968,947	15,131,657	65	65	45,231,880	44,400,246	194	190
21. Uncollectible railway revenues	64,531	79,166	....	....	180,678	168,195	1	1
22. Railway operating income	14,489,941	66,948,017	62	287	47,755,025	79,899,989	205	342
23. Equipment rents	(D)2,198,263	(D)3,126,754	(D)9	(D)13	(D)4,416,558	(D)6,219,640	(D)19	(D)27
24. Joint facility rents (Dr. Bal.)	1,449,070	1,064,457	6	5	3,677,689	3,319,989	16	14
25. Net of items 22, 23 and 24	10,842,608	62,756,806	47	269	39,660,778	70,360,360	170	301
26. Ratio of operating expenses to operating revenues, per cent	92.17	77.57	....	....	91.72	86.78	....	....

Atlantic City Mechanical Convention

The American Railroad Association has issued the calendar for the first annual convention of Section III—Mechanical, which is to be held at Atlantic City, N. J., June 18 to 25. The order of business is as follows:

Wednesday, June 18, 9:30 *A. M. to* 1:30 *P. M.*

Prayer; address of welcome by the mayor of Atlantic City; address by the chairman.

Action on Minutes of Annual Meeting of 1918 (M. C. B.); Report of Secretary and Treasurer (M. C. B.).

Appointment of Committees on Subjects, Resolutions, Correspondence, Obituaries, etc.; Unfinished business; New business.

Report of General Committee, including announcement of nominations for members of Nominating Committee; Discussion of Reports on Nominations; Standards and Recommended Practice (M. C. B.); Train Brake and Signal Equipment; Brake Shoe and Brake Beam Equipment.

Wednesday, 3 *P. M.*

Revision of the Rules of Interchange, including consideration of the following reports of committees: (1) Arbitration; (2) Revision of Prices for Labor and Material; (3) Depreciation for Freight Cars; (4) Revision of Passenger Car Rules of Interchange.

Thursday, 9:30 *A. M. to* 1:30 *P. M.*

Discussion of Reports on Car Wheels; Standard Blocking for Cradles of Car Dumping Machines; Specifications and Tests for Materials (M. C. B.); Welding Truck Side Frames, Bolsters and Arch Bars; Couplers; Draft Gear.

Question proposed by members.

Friday, 9:30 *to* 1:30

Discussion of Reports on Safety Appliances; Loading Rules; Car Construction; Car Trucks; Train Lighting and Equipment; Tank Cars.

Questions proposed by members.

Saturday, 9:30 *to noon*

Consideration of Rules of Order, Election of Officers, General Committee and Nominating Committee, Presentation of badges to retiring officers, etc.

Monday, June 23, 9:30 *to* 1:30

Address of Vice-Chairman; Action on minutes of 1918 Annual Meeting (M. M.); Reports of Secretary and Treasurer (M. M.).

Discussion of Reports on Standards and Recommended Practice (M. M.); Mechanical Stokers.

Paper on "Standardization," by Frank McManamy.

Questions proposed by members.

Tuesday, 9:30 *to* 1:30

Discussion of Reports on Fuel Economy and Smoke Prevention; Specifications and Tests for Materials (M. M.); Design and Maintenance of Locomotive Boilers; Locomotive Headlights; Superheater Locomotives.

Paper on Carbonization in Valve Chambers and Cylinders of Superheated Steam Locomotives, by F. P. Roesch.

Amalgamation of other Mechanical Associations with Section III, A. R. A.

Questions proposed by members.

Wednesday, 9:30 *to* 1:30

Discussion of Reports on Design, Maintenance and Operation of Electric Rolling Stock.

Paper on The Use of Bronze for Valve Snap Rings and Piston Surfaces, and for Bull Rings in Large Cylinders, by C. E. Fuller.

Discussion of Reports on Train Resistance and Tonnage Rating; on Subjects; on Resolutions, Correspondence, etc.

Unfinished business; questions proposed by members and closing exercises.

American Association of Engineers

The annual convention of the American Association of Engineers was held at Chicago on May 12 and 13. The officers of the association elected at the convention are as follows: President, F. H. Newell; first vice-president, W. W. DeBerard; second vice-president, T. A. Evans. Among those elected as members of the board of directors are W. W. K. Sparrow, corporate chief engineer of the Chicago, Milwaukee & St. Paul; A. A. Mathews, chief engineer of the St. Louis-Southwestern System, and E. F. Collins, valuation engineer of the St. Louis-San Francisco.

Traffic News

The El Paso (Tex.) Chamber of Commerce now has a traffic bureau, under the direction of A. E. Tadlock.

The Dallas (Tex.) Embargo Bureau has been discontinued and embargo advices affecting any line of the Southwestern region should hereafter be addressed to the regional director.

The Traffic Club of Chicago gave a farewell luncheon to William Gourlay, general agent at Chicago for the American Railway Express Company and vice-president of the Traffic Club of Chicago, on May 6. Mr. Gourlay leaves shortly for London, England, where he will act as manager of the American Express Company.

Frank M. Williams, of Albany, N. Y., New York state engineer, under whose supervision the New York State barge canal was completed, addressed the Toledo (Ohio) Commercial Club at a meeting at Toledo, May 8, for the purpose of creating interest in the proposed barge canal from Toledo to Cincinnati with a branch to Lake Michigan.

The director general reports 9,147 cars of export freight, exclusive of bulk grain and coal, as received at North Atlantic ports for the week ended May 7, while 9,393 cars had been delivered. On May 7 there were 17,720,670 bu. of grain in elevators at North Atlantic ports; received during the week 7,307,905 bu.; 8,241,393 bu. cleared. At South Atlantic and Gulf ports there were 10,216 carloads of export freight on hand on May 7, as compared with 10,582 cars for the week previous.

The Southern Traffic League at a recent meeting at Augusta, Ga., elected the following officers: W. E. Gardner, president, Jacksonville, Fla.; J. T. Slatter, vice-president, Columbia, S. C.; Howard H. Stafford, vice-president, Augusta, Ga.; C. W. Hayward, secretary-treasurer, Meridian, Miss. Recommendations were adopted for the appointment of shippers to places on freight traffic committees as follows: Southern Regional Committee, M. M. Caskie, Montgomery, Ala.; New Orleans Eastern Committee, C. W. Hayward, Meridian, Miss.; Birmingham district, R. G. Cobb, Mobile; Atlanta, Geo. W. Forrester, Atlanta; Louisville, A. F. Vandergrift, Louisville, and E. DeL. Wood, Chattanooga; Richmond district, W. D. Nelson, Jacksonville, Fla. Resolutions were adopted urging municipalities, boards of trade and chambers of commerce to propose traffic committees for their respective cities and recommending the employment of traffic managers and the maintenance of traffic bureaus. Resolutions were adopted stating that the Southern Traffic League is opposed to the sailing day plan as proposed for general application and that the league is opposed to the four o'clock closing hour for freight receiving stations. Resolutions were also adopted opposing rate increases as shown in General Order 28 and calling for a committee to investigate the Southern Weighing and Inspection Bureau and report to the league as to the advisability of filing a formal complaint with the Interstate Commerce Commission asking for an investigation of the bureau.

Opportunities for Home-Seekers

The United States Railroad Administration, through its Agricultural Section, has issued a booklet giving in detail the opportunities offered to home-seekers in Wisconsin and upper Michigan. The material was collected by the agricultural representatives of the railroads under federal control in these two states, in co-operation with the officers of the states. The booklet contains information about production, markets, transportation facilities, climate, schools, churches, roads and living conditions. Opportunities for homeseekers are found especially in the "cut-over lands" of upper Wisconsin and the upper peninsula of Michigan, and the booklet gives detailed information about how the homeseeker can make a success in the locality described.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission on the petition of the Midland Valley, has appointed Commissioner H. C. Hall, Attorney Examiner A. G. Hagerty and W. H. Carleton, assistant chief examiner of accounts, as a board of referees for the purpose of determining the company's just compensation under the federal control act.

Court News

Employers' Liability Act

The Circuit Court of Appeals, Fourth Circuit, holds that a railroad employee, who cleaned and iced intrastate and interstate cars, and who was proceeding to get the ice when injured, was not engaged in interstate commerce authorizing suit under the act.—Southern vs. Pitchford, 253 Fed. 736.

Tank Cars

The obligation to carry goods safely often requires that special kinds of cars be supplied for the transportation of goods which the carrier has accepted. But where articles of an extraordinary character are offered, a carrier is not bound to accept them or to provide facilities of a different kind from those usually furnished for transportation. For this reason a carrier may be excused from acceptance of explosives or of goods that are improperly packed. There are other limitations of the carrier's duty to accept goods, growing out of the usual course of business and the limitations of convenience; so carriers are not bound to accept as baggage articles that by reason of bulk or value transcend their customary limitations. The ordinary freight cars of the railroads, because of their dimensions, impose restrictions of length, width, and height to commodities that may be carried, and they are wholly unsuitable for the transportation of articles such as acids, oils and gases, which are not packed in containers. In the case of U. S. vs. Pennsylvania, 242 U. S. 208, 37 Sup. Ct. 95, the Supreme Court of the United States recognizes the fact that a tank car is not only a car but a package for the goods. If the producer of oil may demand of the carrier a specially constructed car suitable as a container of the article produced by him, there is no reason why the producers of the various forms of gases, liquids, and solids may not also require peculiar cars suitable for such unpacked products. In the private car case (50 I. C. C. 652, July 31, 1918) the Interstate Commerce Commission found that there are 59 varieties of liquids that are regularly transported in tank cars; also that very few railroads in the United States furnish tank cars for the use of shippers (see also U. S. vs. Penn. 242 U. S. 208) and that railroad tariffs usually provide that the carriers assume no obligation to furnish tank cars. There is an economic waste in the use of tank cars, because usually they are returned empty. Under the rules of interchange, a railroad may own a large supply of such cars, and yet have none available on its own lines. The rule is a reasonable one that if the shipper wishes to compel the carrier to accept his goods he must properly prepare and pack his product to suit the cars that the carrier assumes to supply, and which are ordinarily furnished by carriers for such products, and that it is not the usual practice of railroads to furnish tank cars for shippers. Applying these principles, the Circuit Court of Appeals, Eighth Circuit, holds that a railroad company is not required to furnish tank cars to carry the oils of a refinery; and where the tariffs of a railroad which owned no tank cars did not purport that tank cars would be furnished, and the railroad had leased tank cars, some of which it allowed a refinery to use, it might withdraw the use of the cars from the refinery when they were needed to carry water to supply its engines, etc.—Rock Island vs. Lawton Refining Co., 253 Fed. 705.

Equipment and Supplies

Tests of Locomotive Specialties

The Inspection and Test Section of the Railroad Administration is considering the question of tests of locomotive specialties, such as bell ringers, fire-doors, electric headlights, and would be glad to receive full information from the various manufacturers desiring to participate in the tests. Communications should be addressed to C. B. Young, manager, Room 709, 1800 Pennsylvania avenue, Washington, D. C.

Regional Director Inquiring Into Possibilities of Locomotive Orders

R. H. Aishton, regional director of the Northwestern region, in a telegram to Northwestern roads states that locomotive builders are urging the placing of orders for locomotives in order that they may keep their shops in operation, and also keep down the overhead cost of the locomotives that have been or will be built. The telegram asks for information as to the number and type of additional U. S. standard locomotives that will be required on lines in this region and whether or not approved by the railroad corporation. If the corporations are not willing to buy the United States standard type they are asked to give the number and the type or types that they will be willing to purchase of their own standard.

Locomotives

THE ITALIAN STATE RAILWAYS have ordered 150 superheated consolidation locomotives from the American Locomotive Company. These locomotives will have 21¼ in. by 27½ in. cylinders and a total weight in working order of 149,600 lb. These engines will be duplicates of an order of 150 locomotives ordered last year and bring the total number of engines ordered since the first orders placed by Italy in this country in 1916, to 400.

Freight Cars

THE GREGG COMPANY, Hackensack, N. J., is inquiring for one storage battery truck.

THE PENNSYLVANIA COAL COMPANY, New York, has placed an order for 100 mine cars.

THE UNITED STATES IRON & STEEL COMPANY, New York, is inquiring for 6 small motor cars.

THE H. KOPPERS COMPANY, Pittsburgh, Pa., is inquiring for one 50-ton, coke quenching car and one 5-ton lorry car.

OSCAR C. SINTAS, Havana, Cuba, has ordered 60 cane, and 10 40-ton, 6,500-gal. tank cars, from the American Car & Foundry Company.

THE BUENOS AIRES RAILWAY, has ordered 12, 10,000-gal. tank cars and mountings from the American Car & Foundry Company.

THE LIBERTY COAL MINING COMPANY, Osceola Mills, Pa., has ordered one wooden mine car from the American Car & Foundry Company.

THE REPUBLIC TRADING COMPANY, New York, is inquiring for 10 36-in. gage cane cars and a number of 36-in. gage dump cars for export to Nicaragua.

VIELE, BLACKWELL & BUCK, New York, are inquiring for 40, 20-ton capacity ore cars, 4 flat cars, 3 dump cars, and 200 cars of 22 different types, for export to China.

THE RAILWAYS OF THE UNION OF SOUTH AFRICA are asking bids on 650 goods wagons and will probably want more. They are seeking American bidders as well as others.

Supply Trade News

Geo. L. Fowler, consulting mechanical engineer, has moved his office from 83 Fulton street to 120 Liberty street, New York.

Captain J. A. McIntosh, who has been in the service overseas with the Tank Corps, has returned to his former position in the engineering department of the Ohio Brass Company, Mansfield, Ohio.

Charles Gilman, whose election as vice-president of the **Massey Concrete Products Corporation,** with headquarters in New York, was announced in the *Railway Age* of April 25, was born in 1882 at Cambridge, Mass., and received his education at Harvard University, graduating in 1904. His first construction experience was obtained in connection with building of the Harvard stadium in 1903. The following two years he was engaged in work on the New York subways. In 1911, Mr. Gilman became identified with the concrete products business as assistant to the vice-president of the American Concrete Pile & Pipe Company, and when this organization was taken over by the C. F. Massey Company in 1912 he was appointed Eastern engineer. The following year he was advanced to Eastern manager, which position he held until his recent election as vice-president in which capacity he will have charge of sales in the Eastern territory of the corporation, comprising the New York, Pittsburgh, Southern and Canadian districts.

C. Gilman

A. P. Van Schaick, district sales manager of the Lackawanna Steel Company, at Chicago, has resigned to become special representative, with headquarters in Chicago, of the **American Chain Company, Inc.,** Bridgeport, Conn., effective May 15. Mr. Van Schaick began his business career in 1903, at which time he left Williams College, Williamstown, Mass., to enter the railroad sales department of the Pittsburgh Plate Glass Company, with headquarters in Chicago. From 1906 to 1910 he was in the employ of the Universal Railway Supply Company, with headquarters in the same city, resigning from that position during the latter year to become district sales manager of the Lackawanna Steel Company at Chicago. Mr. Van Schaick has been active in the work of railway supply organizations and especially of the National Railway Appliance Association. He was elected a member of the executive committee of this association in 1910, vice-president in 1911, and president the following year. He is still a member of the executive committee.

A. P. Van Schaick

The Baldwin Locomotive Works has recently established a separate department for handling foreign sales in charge of **F. de St. Phalle,** recently elected vice-president and with **Reeves K. Johnson** as manager of foreign sales.

The American Steam Conveyor Corporation, Chicago, has appointed **N. B. Stewart** district representative in charge of its St. Louis territory. Offices have been opened at 708 Merchants-LaClede building, St. Louis, Mo.

Mudge & Co., Chicago, have awarded contracts for the erection of a one-story factory 190 ft. by 194 ft., at West 16th street, Chicago. The superstructure of the new building will be of steel and brick. It will cost approximately $75,000.

Captain Charles S. Pillsbury, who was assistant sales manager of the **Chicago Bridge & Iron Works,** Chicago, prior to his entrance into military service, has been promoted to major and decorated with the French Legion of Honor. Major Pillsbury is in the construction division of the U. S. Army overseas.

Judge S. E. DeHaven, LaGrange, Ky., has resigned as county judge of the fiscal court of Oldham county to become traveling salesman in Kentucky of the **Canton Culvert & Silo Company,** Canton, Ohio, and **L. W. Hurley,** of Lansing, Mich., has joined the sales force of the same company as Michigan culvert salesman.

Frank H. Clark, formerly general superintendent of motive power of the Baltimore & Ohio, has opened offices at 15 Park Row, New York, and will undertake engineering investigations, report upon railway conditions and operations and prepare or co-operate in the preparation of plans and specifications for railway equipment and materials. He will also act in an advisory capacity to export firms and to foreign railway or other concerns purchasing equipment or material from manufacturers in the United States, and make such inspections as may be desired. Mr. Clark was associated for four years with David L. Barnes, consulting engineer, of Chicago, after which he entered the service of the Chicago, Burlington & Quincy, where he held successively the positions of chief draftsman, mechanical engineer, superintendent of motive power and general superintendent of motive power. He resigned his position with that company on December 30, 1910, to enter the service of the Baltimore & Ohio as general superintendent of motive power and held that position for eight years. He is a member of the American Society of Mechanical Engineers, the Franklin Institute and other technical societies. He is also a member of the American Railway Master Mechanics' Association and of the Master Car Builders' Association. He served as president of the M. M. Association for the early part of the term 1918-1919, and of the M. C. B. Association for the term 1910-1911.

F. H. Clark

J. Stanley McCormack, formerly sales manager of the **Bell Locomotive Works, Inc.,** New York City, will return to resume his old position as soon as he receives his discharge from the Naval Aviation Corps. Mr. McCormack enlisted at the outbreak of the war, received his commission, training as a naval aviator, and was detailed to special experimental aviation development. His discharge is expected within the next two weeks.

Frank H. De Brun has been appointed mechanical engineer in charge of design and improvement for **Mudge & Co.**, Chicago, effective May 15. Mr. De Brun was born in Switzerland in 1883 and received his education in the Higher Polytechnic University of Geneva. After graduation from that institution he served three years as an apprentice in mechanical and electrical laboratories in Switzerland and the following two years as a mechanical draftsman for the Coventry Motor Works, Ltd., at Coventry, England. The next seven years he was in the employ of the Royal Automobile Club of London, England, as superintendent in charge of garage and repairs, resigning from that position to come to the United States as manager of the Universal Auto Training School in New York City, where he remained for two years. In the fall of 1917 Mr. De Brun became associated with the Detroit Institute of Technology, where he had charge of the automotive engineering laboratories works, electrical equipment and battery works and special courses in the maintenance and repair of tractors.

F. H. De Brun

E. Roy Gordon has been appointed service engineer of **Mudge & Co.**, in which capacity he will have charge of investigating service given by the products manufactured by that firm and the successful handling, care and operation. He was born on January 17, 1893, at Galveston, Tex., and after graduation from the public schools entered Purdue University, Lafayette, Ind., where he remained for three years, at the end of which time he entered the service of the Pennsylvania at Fort Wayne, Ind., as a special apprentice in the shops of that road. The following year he returned to Purdue University, graduating from that institution as a mechanical engineer in June, 1915. In the fall of the same year he entered the employ of the Atchison, Topeka & Santa Fe in the test department where he remained until December, 1917, at which date he was commissioned a second lieutenant in the ordnance department of the United States army and sent to France. On February 13, 1919, he received his honorable release from the service and returned to the testing department of the Atchison, Topeka & Santa Fe, which position he held prior to his appointment as service engineer of Mudge & Co. on May 1.

E. R. Gordon

Paul H. Schatzmann, foreign representative of the **Joseph T. Ryerson & Son Company,** sailed for Rio de Janeiro, Brazil, April 10, to take charge of the company's interests in Brazil, Argentina and Peru temporarily. In August Mr. Schatzmann will sail for Europe, thence to India, China and Japan. **A. L. G. Gentles** will establish headquarters in London to take care of the interests of this firm in Great Britain and Scandinavia and will leave the United States in May.

The incorporation of the firm of **Oscar F. Ostby & Co.** is announced with Oscar F. Ostby as president with offices, as hitherto, at 1044 Grand Central Terminal, New York. The new company will continue to handle the lines of railway supplies hitherto handled by Mr. Ostby, and in addition Mr. Ostby has been appointed exclusive railway distributor for Davidson high speed steel and tools, manufactured by the Davidson Tool Manufacturing Corporation, New York.

The Clark Equipment Company, manufacturers of "Celfor" drills and precision tools, has just completed a modern hospital at its plant in Buchanan, Mich. The hospital is intended primarily for the use of employees, but is also open to citizens of the community at cost. It contains private rooms and wards, modern operating and x-ray rooms, sterilizers and laboratory equipment. The operation of the hospital is directed by the Clark Hospital Association, a volunteer organization of employees and residents.

John Stevenson, Jr., Sharon, Pa., has acquired a controlling interest in the capital stock of the **Standard Car Construction Company** at Masury, Pa. Mr. Stevenson has purchased the holdings of Bioren & Co., bankers and brokers of Philadelphia, and the holdings of other Philadelphia stockholders. The Standard Car Construction Company is capitalized at $1,400,000, and the original plant was built three years ago. Since then it has been substantially enlarged. When working at capacity it employs 700 men and has a daily production of 20 tank cars.

Surplus Military Railway Equipment in the United States

The War Department has given out the following statement of the amount and value of property on hand or on order available for sale. The figures are as of May 1.

The locomotive and raised pier cranes will be turned over to the Railroad Administration, by arrangement with the director general of railroads, for sale to the railroads.

	Number	Average unit cost	Total cost
Standard gage locomotives	197*	$38,275	$7,540,175
Standard gage cars—			
Box	75	$2,650	$198,750
Gondolas, high side	8,600	2,237	19,235,475
Gondolas, low side	2,850	2,159	6,153,750
Flat	479	1,959	938,361
Tank	400	2,738	1,095,200
Total	12,404†	$2,227	$27,621,536
Locomotive cranes—			
10-ton	38	$12,400	$471,200
15-ton	101	18,992	1,918,226
20-ton	13	19,699	256,092
25-ton	15	26,475	397,122
30-ton	6	25,700	154,200
35-ton	4	34,132	136,528
50-ton	18	32,865	591,570
Total	195‡	$20,128	$3,924,938
Raised pier cranes—			
10-ton 2.4 meter gage	15	$16,884	$253,260
10-ton standard gage	10	21,700	217,000
15-ton 2.4 meter gage	9	20,300	182,700
Total	34†	$19,205	$652,960
Track pile drivers	18	$33,500	$603,000
Grand total			$40,342,609

*All on hand.
†None delivered.
‡Forty-six not yet delivered.

Under the arrangement with the Railroad Administration the director general will use every effort to dispose of the property to the several railroads at market prices at the time and place at which disposition is made. The incidental expenses incident to the care of the material are to be taken from the proceeds of the sale.

This arrangement also covers the transfer of all 80-pound A. R. A. type B. rail which has been declared surplus by the War Department and about 1,366 tank cars purchased by the Ordnance Department, 100 twelve-yard and 1,320 twenty-yard side dump cars, all of which are fitted to comply with Master Car Builders' and Interstate Commerce Com-

mission standards. In the event of termination of federal control of the railroads before this material is entirely disposed of, the material remaining at the time is to revert to the War Department's possession but in all cases where the material has been sold by the Railroad Administration on the deferred payment plan the War Department will protect such arrangements after the federal control of the railroads ceases.

This entire transfer covers approximately $18,000,000 worth of material. The distribution of the property to the railroads will be handled by the director of the Division of Purchases.

The sales of surplus supplies by the department of military railways, as reported to the director of sales up to April 25, amounted to $71,104,130, of which $68,993,837 represented rolling stock. The prices received represented the actual original cost.

The Blaw-Knox Company has taken over the manufacture and field operation of the Uni-Form system of reinforced concrete floor and roof construction, and the Uni-Form system is now incorporated in the Steel Forms department of the Blaw-Knox Company and will be known as "Blawforms." **Nils F. Ambursen,** chief engineer of the Ambursen Hydraulic Construction Company, and the developer of the Ambursen dam, assumes the duties of chief engineer of the Building Form department of the Blaw-Knox Company, and **W. L. Church,** formerly of Westinghouse, Church, Kerr Company, and Lockwood, Greene & Co., engineers, is retained as consulting engineer on the operation of the Uni-Form system.

The Detroit Seamless Tubes Company has begun the construction of a new plant, in Detroit, Mich., which it is estimated will cost $3,000,000, on a tract of 66 acres. The plant will be equipped with the latest types of modern labor saving devices and machines. The first section, costing $1,000,000, will be completed by January 1, 1920, at which time the company will move from its present place of business at West Jefferson avenue and Nineteenth street, Detroit. A subdivision will be created in the vicinity of the building and 150 houses erected for workmen of the company. The entire construction and financing of these homes will be done by the company to assist its employees in their housing problems.

The following changes in the organization of the **Western Electric Company,** New York, will become effective on June 1; **J. M. Skinkle,** formerly in the engineering department, has been appointed assistant manager of the government department with headquarters at New York; **J. A. Pizzini,** sales manager at New York, has been appointed assistant manager at the same place; **W. J. Drury,** until recently manager of the Cleveland branch, has been appointed sales manager at New York, to succeed Mr. Pizzini; **A. M. Collins,** formerly sales manager at the Detroit office, succeeds Mr. Drury as manager of the Cleveland branch, and **A. R. Maynard,** until recently connected with the sales department in Chicago, has been appointed sales manager at Detroit, succeeding Mr. Collins.

The Safety Car Heating & Lighting Co. Elects New Officers

At the annual election by the board of directors of the Safety Car Heating and Lighting Company, **W. L. Conwell** was made president of the company; **J. A. Dixon, Randolph Parmly** and **James P. Soper,** vice-presidents; **C. W. Walton,** secretary and treasurer; **Wm. Stewart,** assistant secretary and assistant treasurer. Mr. Conwell came with the company January 1, 1916, as assistant to the president. Upon the death of R. M. Dixon, former president of this company, October 16, 1918, Mr. Conwell was made acting president.

At the annual stockholders' meeting, held on May 8, F. F. Fitzpatrick, president of the Railway Steel Spring Company, was elected to the board of directors. The board of directors is now made up of the following: Chellis A. Austin, president, Mercantile Trust Co.; Robert Barbour, president, Barbour Flax Spinning Co.; E. M. Bulkley, Spencer Trask & Company; Henry R. Carse, president, Submarine Boat Corporation; W. L. Conwell; J. A. Dixon; F. F. Fitzpatrick, president, Railway Steel Spring Company; E. LeB. Gardner, president, New Jersey General Security Co.; A. B. Hepburn, chairman, advisory board, Chase Natl. Bank; R. Parmly; G. D. Pope, capitalist; Alex. C. Soper, capitalist; Henry H. Wehrhane, Hallgarten & Company, and Jas. P. Soper, president, Soper Lumber Co.

Vauclain Succeeds Johnson as Head of Baldwin Locomotive Works

Alba B. Johnson, president of the Baldwin Locomotive Works, has resigned from that position and has been succeeded by **Samuel M. Vauclain,** hitherto senior vice-president. Mr. Johnson, who had been contemplating the step for a considerable time, presented his resignation at a special meeting of the board of directors in Philadelphia, May 9. He will retain his extensive interests in the company and will remain a director. In connection with the resignation and the election of Mr. Vauclain as president, there were rumors of friction between different interests in the company, but the existence of such friction has been emphatically denied by Mr. Johnson and Mr. Vauclain alike.

A. B. Johnson

Following the meeting of the board of directors, Mr. Johnson issued a statement in which he explained that he had desired to withdraw from the presidency of the company in order to devote his time to his extensive personal and public interests and in which he expressed his wishes for the success of Mr. Vauclain. The statement said:

S. M. Vauclain

"For a long time I have contemplated a withdrawal from active business to be free to devote myself to matters of personal and public interest. For a time it seemed desirable to postpone this until the business and resources of the Baldwin Locomotive Works could be more firmly established. When the war broke out in Europe, and especially when our country engaged in war it became a patriotic duty to continue until assured that the war was over.

"Peace has now come and the financial strength of the works has been placed upon an assured basis. I feel that the time has now arrived when my responsibility to the stockholders can be laid aside without prejudice to any interest which has been confided to me.

"My connection with these works has extended now over the whole of the lifetime which I can remember. My father entered the employ of Mathias W. Baldwin & Co. in the spring of 1863, and continued in it for 29 years until 1892. My own service began May 14, 1877, forty-two years ago, and the entire energies of my active business life have been de-

voted to upbuilding the properties and reputation of the works.

"The extent to which this has been accomplished is a source of pride and gratification. It has not been the work of any one man. Our honored predecessors laid the strong foundation on which we have builded, and the structure that has been raised upon those foundations is the work of many. I hope that what has already been accomplished may be only the beginning of their growth and prosperity in the future.

"To Mr. S. M. Vauclain, with whom I have been associated so long, and who succeeds me as president, I wish all possible success and I hope that he will enjoy the same measure of co-operation and loyalty that has been given me through all these years."

Mr. Vauclain declined to issue any statement, but said in answer to a question that there would be no change in the policy of the company.

Mr. Johnson has been connected with the Baldwin Locomotive Works since 1877 and its president since 1911. He was born at Pittsburgh, Pa., February 8, 1858, and upon his graduation from the Central High School of Philadelphia entered the employ of Burnham, Parry, Williams & Co., as the present Baldwin Locomotive Works was then known, as a junior clerk in May, 1877. On the advice of John H. Converse he studied stenography and then for about 20 months was in the employ of William Sellers of the Edge Moor Iron Works, Wilmington, Del. Upon returning to the Baldwin Works he became secretary to Mr. Converse and served in that capacity for 33 years, gradually working up in the company and taking over Mr. Converse's work. In 1896 he was made a partner in the firm of Burnham, Williams & Co., as the firm had then become known, and was in charge, first of sales and later, on the withdrawal of George Burnham, Jr., of sales and finances. Upon the incorporation of the company under the name of the Baldwin Locomotive Works on July 1, 1909, he was elected vice-president and treasurer and succeeded to the position of president on July 1, 1911.

In the period in which Mr. Johnson was president the company had what may truly be called a phenomenal growth, its gross sales having increased from a total of $29,000,000 in 1912, the first full year after he became the head of the company, to over $98,000,000 in the year ended December, 1918. The total undivided profits over the same period increased from $4,470,000 in 1912 to $5,752,000 in 1918, while in 1917 a total was reached of $8,306,000, excluding the return from the Standard Steel Works Company and the Southwark Foundry & Machine Company.

Mr. Johnson has extensive personal and public interests, and is one of the country's leaders in export trade. He is president of the Railway Business Association; a member of the National Foreign Trade Council, having acted as president of all the National Foreign Trade Conventions with the exception of the one in Cincinnati last year; president of the Pennsylvania State Chamber of Commerce; vice-president of the Philadelphia Chamber of Commerce. In addition to these he was formerly president of the American Manufacturers' Export Association and is now acting president of the Jefferson Medical College and Hospital and a leading member in a number of other organizations.

Samuel M. Vauclain, the new president of the Baldwin Locomotive Works, has been connected with the company or its predecessors since 1883, and its senior vice-president since 1911. He entered the employ of the plant in 1883 as a foreman. In November, 1885, he was promoted to superintendent of equipment, and in 1886 was advanced to general superintendent. He became a member of the firm of Burnham, Williams & Co., in 1896 and in 1911 was elected a vice-president of the Baldwin Locomotive Works. It is through his work as manager of operations in the Baldwin Works that Mr. Vauclain is generally recognized as one of the leaders in shop management in the country.

Mr. Vauclain's greatest work, however, was during the war, not only in connection with the work of the Baldwin Locomotive Works in supplying locomotives for the allied armies overseas, but also in connection with the great shell making plant of the Eddystone Munitions Company at Eddystone, Pa. Mr. Vauclain was on a number of occasions called into consultation with various of the allied governments and so well was his work regarded that he was made a chevalier of the Legion of Honor by the French Government. In connection with our own part in the war, he served with the Council of National Defense, first in an advisory capacity and later as chairman of the committee on ordnance and as chairman of the committee on cars. After the War Industries Board was organized he became chairman of that body's special committee on plants and munitions and was also the head of the committee of car and locomotive builders.

General Miller Heads New Oil Company

General Charles Miller, of Franklin, Pa., is to assume the chairmanship of the board of directors of the **Home Oil Refining Company of Texas,** on June 1. General Miller occupies a unique position in the history of American railroads. He was the first man to recognize the great importance of scientific study of oil and lubrication problems in transportation, and he taught the railroads the best ways and means to efficient economical use of lubricating oils. Prior to 1869 the railroads began using what was known as pure West Virginia oil (a mineral oil from 28 to 29 gravity with a cold test of 10 below zero and a fire test of 175). This oil displaced all the fatty oils and tallow previously in use. In July, 1869, General Miller formed a partnership with three associates and began to manufacture an oil in all appearances like pure West Virginia oil and meeting the same tests. The product was, however, superior because of the addition of certain materials. The company made a specialty of supplying railways with cylinder, engine and freight car oils. General Miller studied the subject of railway lubrication in all its aspects. His company was the first to formulate a plan of furnishing railway oils under contracts guaranteeing the cost per thousand miles on locomotives and freight cars. It was the first to organize a department of lubrication experts, whose services were given to the railroads, teaching all ranks of employees how to use oil economically.

General Charles Miller

In 1878 the Galena Signal Oil Company was shipping 12,000 barrels per year, supplying about 15 per cent of the railroad mileage in the country. In 1918 its product was said to be standard upon approximately 98 per cent of the entire railway mileage of the United States and Canada, with a large export trade to France and South America. With the advent of electric railways the company developed special oils to meet their requirements, making contracts on the same basis which had proved so satisfactory to the steam railroads. Not only did the company furnish lubricants to the railways but also signal oil, long time burner oil, headlight oil and other illuminating oils.

General Miller severed his connection with the Galena Signal Oil Company some months ago because of differences of opinion as to policy. The Home Oil Refining Company which he is to head as chairman of the board has large oil contracts covering a production of 7,500 barrels per day in the Ranger and Burkburnett (Texas) fields. It also holds leases on approximately 200,000 acres of oil lands exceptionally well located and now in process of development. The company owns a refinery at Yale, Oklahoma, now operating at 2,500 barrels daily capacity. It is constructing a large refinery at Fort Worth which will be in operation in a few weeks. Nearly 600 men are now engaged in the construction work on the site of 165 acres located on the St. Louis-San Francisco Railway in the outskirts of Fort Worth. Recently the Home Oil Refining Company purchased a convenient site of 50 acres at Franklin, Pa., for the erection of a large plant to be devoted to the production of railroad oil.

In assuming the chairmanship of the Home Oil Refining Company of Texas, General Miller heads an organization which covers the entire field of oil production, manufacture and sales. The present list of officers and directors of the Home Oil Refining Company, is as follows: President, **W. M. Babcock,** formerly Mid-Continent manager of the Humble Oil & Refining Company; operating vice-president and general manager, **M. A. Isaacs,** Tulsa, Oklahoma; assistant operating vice-president and general manager, **John B. Given,** formerly associated with General Miller in the Galena Signal Oil Company; vice-president, **Sam Davidson,** Fort Worth; vice-president, **William Churchill,** formerly sales manager of Corning Glass Works; treasurer, **Benjamin J. Tillar,** Fort Worth; secretary **Harry M. Bronner,** New York. The board of directors headed by General Charles Miller, as chairman, consists of the officers of the company and nine other members of whom the following have already been appointed: W. C. Stripling, Fort Worth; Sam Levy, Fort Worth; G. H. Golvin, Fort Worth; Paul D. Langdon, New York.

Westinghouse Company Establishes Memorial Scholarships

As a war memorial to the more than 8,000 employees of the Westinghouse Electric & Manufacturing Company who have entered the service of the government in the war, the company has decided to establish a number of technical scholarships. The details of the plan by which this will be done have been given out by President E. M. Herr as follows:

Four War Memorial Scholarships will be established each year under the following general conditions:

(a) Candidates will be limited to sons of employees of the Westinghouse Electric & Mfg. Company and its subsidiaries, who shall have been employees in good standing for a period of five years.

(b) Two of such annual scholarships may be open to the younger employees of the company or its subsidiaries who have been in their service for a period of at least two years and who do not exceed the age of 23.

(c) The selection is to be determined by competitive examination, to be conducted annually by the company's educational department under the direction of the committee hereinafter provided. The examination is to take into account not only the applicant's academic training and preparedness, but due consideration will be given to personal qualifications, general character and aptitude.

(d) Scholarships will entitle the successful candidate to pursue a four year's course in any technical school or college that he may select with the approval of the committee. The scholar may pursue a course in any branch of engineering that he may select.

(e) Scholarships will be granted for one year only but will be continued for the full four years provided the scholar pursues a course in any branch of engineering that he may select.

(e) Scholarships will be granted for one year only but will be continued for the full four years, provided the scholar maintains the academic and other standards required by the college or institution in which he elects to pursue his course of study.

(f) Each scholarship carries with it an annual payment of $500, to be made in two installments and the number of new scholarships will be four each year.

(g) The company will establish a memorial scholarship committee consisting of three vice-presidents of the company, to whom shall be referred the names and records of the candidates, and who will select therefrom the four successful persons who, in its judgment, have most satisfactory met the tests applied. The said committee will also be charged with the duty of establishing the detailed rules and regulations and such other matters of administration as have to do with this particular matter.

It is the intention of the company to continue these memorial scholarships from year to year but the company reserves the right to recognize changing conditions and to modify the plan or discontinue it entirely if, in its judgment, it seems wise and expedient to do so.

Trade Publications

CROSSING FROG COSTS.—The International Steel Tie Company, Cleveland, Ohio, has issued a folder describing the crossing foundations manufactured by that company, and giving a list of the railroads which have used these foundations and an exposition on the economies accruing from the use of this construction.

CABLEWAYS.—The Lidgerwood Manufacturing Company, New York, has issued a 10-page booklet describing its various types of cableways and transfers for storing and reclaiming coal, handling ashes and similar materials. These include the stationary cableway, the traveling cableway, the radial cableway and Lidgerwood transfer. All of these types are illustrated by means of diagrams showing clearly the character of work performed by each type. Three pages of the booklet are devoted to particular installations.

Financial and Construction

Railway Financial News

BOSTON & MAINE.—James L. Doherty of Springfield, Mass., and the other trustees named in the government's dissolution suit against the New York, New Haven & Hartford have petitioned the Federal District Court to extend until July 1, 1921, the time to sell the stock of the Boston & Maine. There are 251,480 shares of the preferred stock of the company and 250,254 shares of the common stock that must be sold. In their petition the trustees assert that since the date of their appointment the financial condition of the Boston & Maine has been such that it has been impossible to dispose of these large quantities of stock without a great and unreasonable sacrifice.

CANADIAN NORTHERN.—William A. Read & Co. are offering an issue of $7,500,000 6 per cent equipment trust certificates at prices yielding from 5½ to 6 per cent. The certificates are issued against new railway equipment costing $10,724,705, the company making an initial payment of $3,224,705, or 30 per cent of the cash contract cost.

DELAWARE & HUDSON.—President L. F. Loree told stockholders at their annual meeting on Tuesday that maintenance of way has been inadequate both as to quality and quantity in the year just passed. He said in part: "The President, in taking over your property, gave assurance that your property would 'be maintained during the period of federal control in as good repair and as complete equipment as when it was taken over by the government.' In the matter of locomotive power you need feel no present apprehension. Your shop equipment is ample and it has been used to keep in repair not only your own locomotives, but as well some owned by connecting lines. The situation in regard to your freight cars is not so reassuring. Where, as formerly, the great majority were on your own rails, and the balance were returned thereto at frequent intervals, now nearly 90 per cent are on foreign lines. No clear idea can be had of their condition. During the past year 131 freight cars were dismantled by the Railroad Administration for various causes, and none of these vacancies has as yet been filled. In the matter of maintenance of way there has been a serious falling off in the application of material."

NORFOLK & WESTERN.—Bernhard, Scholle & Co., the Bankers Trust Company of New York and the Union Trust Company of Pittsburgh are offering for subscription, at the market, $2,500,000 Norfolk & Western convertible ten-year 6 per cent bonds dated September 1, 1919, and maturing September 1, 1929. They are a part of a total authorized and outstanding issue of $17,945,000 represented by subscription receipts exchangeable on September 1, 1919, for definitive bonds and are convertible at par into common stock of the company at the option of the holder at any time between September 1, 1919, and September 1, 1929.

Railway Construction

CHICAGO & NORTHWESTERN.—Work has been authorized and will be started at an early date upon the construction of a new passenger station at Clinton, Ia. The new structure will be of brick, one story high, 28 x 287 ft., with a tile roof and a concrete substructure. A small power house, 47 x 57 ft., one story high, of brick construction will be built in conjunction with the new station and the total cost with necessary improvements will be approximately $250,000. The contracts for the work have not been let.

Chicago & North Western is completing an addition to its division shops at Kaukauna, Wis., to be used exclusively for the production and compression of acetylene gas for welding and cutting tools used at its various shops in central and northern Wisconsin, heretofore supplied from Chicago. These new plants and equipment represent an investment of about $5,000.

Railway Officers

Railroad Administration

Regional

The office of **E. J. Henry** supervisor of rail-and-lake traffic, with jurisdiction over the Lehigh Valley Transportation Line and the interchange of business of other lake lines with railroads of the United States Railroad Administration, has been transferred from Buffalo, N. Y., to Chicago, Ill. (La Salle Street Station).

Federal and General Managers

N. L. Howard, until recently colonel in command of the Thirteenth Engineers (Railway) regiment and formerly division superintendent on the Chicago, Burlington & Quincy, with headquarters at Hannibal, Mo., has been appointed assistant to the federal manager of this road, with headquarters at Chicago.

Operating

John F. Clark, trainmaster on the Northern Pacific, with headquarters at Missoula, Mont., has resigned.

The headquarters of **F. W. Kelsey,** superintendent of the Chattanooga division of the Nashville, Chattanooga & St. Louis, have been moved from Nashville, Tenn., to Chattanooga.

R. E. Hoard, trainmaster on the Champlain division of the Delaware & Hudson, at Plattsburg, N. Y., has been transferred to the Saratoga division, with headquarters at Albany, vice **L. A. Crounse,** assigned to other duties, and **J. J. Rounds,** assistant trainmaster on the Saratoga division, with headquarters at Albany, succeeds Mr. Hoard.

Financial, Legal and Accounting

H. A. St. John, auditor of the Lake Superior & Ishpeming and the Munising, Marquette & Southeastern, with headquarters at Marquette, Mich., has been promoted to acting federal auditor, with the same headquarters. **G. F. St. John,** cashier of the same lines, with headquarters at Marquette, has been promoted to acting federal treasurer, with the same headquarters.

Traffic

B. C. Prince, assistant to traffic manager of the Seaboard Air Line, at Norfolk, Va., has been appointed assistant traffic manager, and the position of assistant to traffic manager has been abolished.

L. B. Burford, assistant to general traffic manager on the Erie, at Chicago, has been appointed assistant general freight agent on the Erie Railroad Lines—Buffalo, Salamanca, N. Y., and east thereof, with office at New York, N. Y.

G. C. Manning, assistant general freight agent of the Erie, with headquarters at Youngstown, Ohio, has been transferred to Chicago. He succeeds **G. J. Vizard,** who has resigned to engage in other business; **D. L. Wells,** division freight agent at Meadville, Pa., succeeds Mr. Manning, and **E. W. Vail** succeeds Mr. Wells.

Engineering and Rolling Stock

S. A. Chamberlain has been appointed superintendent of motive power of the Lake Superior & Ishpeming and the Munising, Marquette & Southeastern, with headquarters at Marquette, Mich.

J. D'Esposito, assistant chief engineer of the Chicago Union Station Company, Chicago, has been promoted to chief engineer, effective May 1, succeeding **Thomas Rodd,** who has been appointed consulting engineer.

R. L. Schmid has been appointed assistant division engineer of the Nashville, Chattanooga & St. Louis, with office at Nashville, Tenn., vice **J. L. Fergus,** who has been appointed assistant engineer. The headquarters of **D. E. Counts,** supervisor of bridges and buildings, have been moved from Atlanta to Chattanooga.

T. J. Cutler, general master mechanic on the Northern Pacific, with headquarters at St. Paul, Minn., has been transferred to Livingston, Mont., with jurisdiction over the lines from Mandan, N. D., to Paradise, Mont., succeeding **C. E. Allen,** whose appointment as general master mechanic of the lines east of Mandan, N. D., was noted in the *Railway Age* of May 9.

J. J. Corcoran, assistant engineer on the New York Central, with headquarters at Albany, N. Y., has been promoted to chief signal inspector East of Buffalo, N. Y., with the same headquarters. Mr. Corcoran will act as a general field assistant to the engineer maintenance of signals and give special attention to the maintenance of relays, signal mechanisms and storage batteries. A graduate of the Worcester Polytechnic Institute, Mass., Mr. Corcoran entered the service of the New York Central as signal helper at Buffalo in June, 1911, since which time he has been, consecutively, assistant maintainer, maintainer, maintenance inspector and construction inspector, draftsman, chief draftsman and assistant engineer.

Corporate

Executive, Financial, Legal and Accounting

Charles C. Rose has been elected corporate treasurer of the Spokane, Portland & Seattle, the Oregon Trunk, the Oregon Electric, and the United Railways Company, with headquarters at Portland, Ore., vice **Paul McKay,** resigned to accept service with the United States Railroad Administration.

Operating

A. L. Smith has been appointed superintendent of the Toronto (Can.) Union station, succeeding **J. J. Beck,** deceased.

Traffic

John Bickel, commercial agent of the Duluth, South Shore & Atlantic, with headquarters at Chicago, has resigned to enter the employ of the Canadian National as traveling agent, with headquarters at Chicago.

H. L. Blackstone, general agent of the Sacramento Northern, at San Francisco, Cal., has been promoted to assistant general freight agent in charge of solicitation, with headquarters at Sacramento, Cal., and the office of general agent at San Francisco has been abolished.

M. A. Thomson, division freight agent of the Canadian National Railways at Ottawa, Ont., having resigned, **George Collins,** special representative of the freight traffic department, will also, until further advised, assume the duties of acting division freight agent, with office at Ottawa, Ont.

Obituary

Thomas W. Barrett, terminal trainmaster on the Pittsburgh district of the Baltimore & Ohio, with headquarters at Glenwood, Pa., was killed in a derailment on May 9.

P. C. Eldredge, formerly general superintendent of the Chicago, Milwaukee & St. Paul, died at his home in Oconomowoc, Wis., on May 8, at the age of 63 years. Mr. Eldredge was born in Sharon Springs, N. Y., in 1856 and entered railway service on October 1, 1879, as an operator on the Chicago, Milwaukee & St. Paul, with which road he served 39 years as chief despatcher, trainmaster, division superintendent, assistant general superintendent and general superintendent, which position he held until August 1, 1918, at which time he resigned to accept a position with the Carnation Milk Products Company, Chicago.